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ABSTRACT

This report includes edited versions of major papers presented at the National Conference on the Improvement of Junior College Instruction held at the University of California, Los Angeles, July 14-16, 1969. In section one, instructional improvement as a major junior college objective and the importance of in-service training are discussed. Section two examines potential sources of improvement assistance including recent elementary and secondary school developments, and the exchange of ideas and effective techniques through staff interpersonal relationships. Also discussed are the assistance that the U.S. Office of Education can provide, and the collection and dissemination of proven instructional objectives through centralized objective exchanges. Section three focuses on several improvement plans currently in use like the instructional-evaluation plan at Golden West College (California) and on the systems approach to teaching and learning used in English, chemistry, and psychology classes at Meramec Community College (Missouri). The use of programed instruction in the teaching of shorthand and typewriting, entertainment films in a humanities-drama course at Miami-Dade Junior College (Florida), and individualized instruction in teaching high-ability, low-achieving students in English are also considered. Section four includes the report with a look at the realities and potentialities of computer-assisted instruction and at specific plans that encourage innovation. (JO)

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The Improvement of Junior College Instruction

A Report of a Conference Sponsored by the UCLA Junior College Leadership Program, the American Association of Junior Colleges, and the University of California Office of Relations with Schools

July 14-16, 1969

Edited by

B. Lamar Johnson

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PREFACE

The junior college is a teaching—not a research—institution. Its effectiveness is dependent upon the quality of its instructional programs. Because it is the most rapidly growing unit of American higher education, the two-year college faces particularly heavy pressures for efficiency and improvement in all aspects of its operation.

In addition, as a young institution, relatively unhampered by the heavy hand of tradition, the junior college has a special opportunity to take leadership in change, innovation, and experimentation in American education. Elsewhere, in discussing the potential of the junior college, as related to innovation and improvement of instruction, I have quoted Spencer:

> The junior colleges seem to me to offer our best chance to stimulate genuinely fresh investigations, and then do something about the answers. Free of the rigid traditions which tie most schools and colleges to their administrative and instructional arrangements, junior colleges can tinker with all sorts of new ideas and put them to work in their classrooms.[1]

It is against such a background as this that the National Conference on the Improvement of Junior College Instruction was held at the University of California, Los Angeles, July 14–16, 1969. More than two hundred representatives of junior colleges from all sections of the United States attended. Attending also were Canadian and Venezuelan educators interested in the community junior college.

Participating in the Conference were representatives of the U.S. Office of Education and the American Association of Junior Colleges.

The definition of specific instructional objectives was emphasized as a basis for planning and improving instruction. The systems approach to instruction was also hghlighted. Several innovative developments in teaching were reported by junior college instructors. Particularly noted were plans which contribute to the individualization of teaching.

This report includes edited versions of the major papers presented at the Conference. It is hoped that the report will be valuable to junior college administrators, instructors, librarians—and to all who are interested in the improvement of teaching in the junior college, as well as in other units of American education.

I express my thanks to William A. Harper, Director of Public Relations of the American Association of Junior Colleges, for editorial services.

B. LAMAR JOHNSON

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[1] Lyle M. Spencer, "A Publisher Looks at Innovation," quoted in B. Lamar Johnson, *Islands of Innovation Expanding: Changes in the Community College* (Beverly Hills, Calif.: Glencoe Press, 1969), p. 33.

SECTION I

The Setting

ED K. ERICKSON

THE IMPROVEMENT OF INSTRUCTION: A MAJOR FUNCTION OF THE JUNIOR COLLEGE

The community junior college provides the greatest promise of leadership for the improvement of instruction to be found in all of American education. That promise is hollow if the importance of curriculum and instructional improvement is not recognized by junior college leaders and faculty members.

Though it is possible to find several well-developed statements of philosophy and purposes for community junior colleges, there is a strong question as to how well all of the functions are met in the face of increased pressure for time and deliberation on matters often not related directly to instruction. The junior college is a relatively young institution. It is therefore not hampered by many of the traditions which have made change slow and often impossible in much of higher education. It would be impossible in this short presentation to outline each of the important elements concerning curriculum improvement in the community junior colleges, but I am convinced that it is probably our most single important mission if we are to succeed in bringing about change.

As administrators, we generally deal in the very broadest sense with our larger missions or philosophies without really knowing whether the philosophies we profess are the same as those expressed by the faculty in their teaching. Robert Hutchins asserts, "The highest function of the administrator is to clarify or to discover the omissions of his colleagues."[1] He also points out that if faculty members have the values which are consistent with the objectives of their college, it is likely that the institution will achieve its purposes. It is clearly important that we involve teachers in the process of developing curricula and improving instruction in the community colleges.

In addition to involvement, what are some of the broad factors that must be taken into consideration in making improvements in curriculum and instruction? The need for curriculum revision and change has usually been based on factors that have had little relevancy to human interests and values. I agree with Dr. John Goodlad's thesis that, hopefully, before too long, we can see some concern for a more humanistic curriculum that displays a concern for human interest and values.

[1] Robert Maynard Hutchins, "The Administrators; Leader or Officeholder," *Journal of Higher Education*, XVI, No. 8 (Nov. 1946), 395–396.

Dr. Goodlad comments on the importance of this humanistic approach to curriculum development. He asks:

> Will increased utilization of knowledge and of rational processes, supposedly the direct benefits from education, arouse us from lethargy before we expire from our own poison or strangle in our own gases? Will increased quantity enhance quality of education, elevate our thoughts and ennoble our aims towards all men? Will the extension of full educational opportunities to all the world's people bring peace? If the answers lie not in education, then we have at present no answers at all.[2]

Another important element in curriculum development that should be considered today is one that bears on a rather overused term, "relevancy." In his most recent book, *Islands of Innovation Expanding*, Dr. B. Lamar Johnson found in his study that the definition of specific instructional objectives—as a basis for developing curriculum, for improving instruction, and for initiating and carrying out innovation—has emerged as a major emphasis. Dr. Johnson says: "The definition of instructional objectives as a basis for improving instruction and curriculum, emerging as it is as an important emphasis at some junior colleges, may well point to a dynamic focus for the future."[3]

Now let us look at the learning objectives as seen in the form of behavior competencies, or curriculum as seen at the level of course detail. Ideally, a student enrolled in a course would not have accomplished any of the skills or knowledges in a particular course before enrolling in it. We would know this from our diagnosis. Ideally, we would fashion for each student the competencies that he would need for growth and progress. From counseling and guidance would come knowledge of student needs and programs for curriculum direction. General education theories and the competencies needed for subsequent course requirements would result in development of particular course objectives.

There can be no totally certain or appropriate set of course objectives, but it is our responsibility to see that there are learning objectives in every course and that these objectives are written in specific, behavioral language. We must recognize, as we strive for this goal, that the faculty has the right to be wrong at times in selecting course objectives. It is the faculty's responsibility to seek help and information, and to work aggressively in the process of selecting and designing course objectives. It is further the faculty's responsibility to reexamine and abandon some objectives when they are found to be invalid, substituting others that are more appropriate.

Let's look at the individual. How do we help educate this tremendously important client? Do we really counsel him in such a way that he understands himself, his potential, and the hurdles he must overcome? Or, do we assign him to sophomore-level high school English because he tells us that he finished the freshman year of high school fifteen years ago? He is told that he must earn so many more "units," which will take him six years of part-time classwork. He is asked to report to a classroom where he finds twenty-five or thirty other adults in rows of classroom desks not unlike the classroom where he had his last academic experience. He is lectured to, shown some audiovisual aids and is given an assignment to complete or read. He returns the next night, maybe,

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[2] John I. Goodlad, "Directions of Curriculum Change," *NEA Journal*, LV, No. 9 (Dec. 1966), 33–37.

[3] B. Lamar Johnson, *Islands of Innovation Expanding: Changes in the Community College* (Beverly Hills, Calif.: Glencoe Press, 1969).

hopelessly lost in his inability to understand the assignment or even to read it with understanding. He will probably not complete the course.

Now if he were our *only* student, and we had the time and the inclination, would our program for him have been planned this way? I doubt it. We would have been a great deal more humanistic. The student would have known much more about himself, where he was academically, where he needed to start in order to succeed toward his objective. Our program and our instructional efforts would have permitted him to progress as rapidly as possible through program materials, self-study, and he would have received individual attention. Some work toward his goal may have been met through television or through challenge by examination. I know of no reason to require "units" when the student simply wants a diploma that shows he has mastered a high school program. I personally know of intelligent adults who have achieved this goal—a high school diploma—in one year's time. Why not structure programs and the instructional efforts with concern for the human being and with understandable objectives that can be achieved in a variety of ways that will challenge the variety of students we enroll?

Let us look at an important program, one that should receive major consideration in our community colleges, i.e., the occupational-technical program. This program is lacking in many of our community colleges. It would be a vital part of every community college program.

We must, if our colleges are to be comprehensive, offer programs in occupational-technical education that are phrased in terms of student needs and in terms of industrial and business requirements. The programs, once introduced, must be designed to meet individual as well as industrial business needs. All too often colleges get hung up on credits, degrees and academic requirements. I believe, for instance, that a general education is desirable for everyone, but not at the expense of eliminating the student who needs enough marketable skills so that he can get a job. He can't be sold on "culture" until he and his family can eat. Chances are he will return for more education if we do the right thing by him the first time around. Why not diploma courses and certificate courses, as well as degree programs? Why not the "slot-in" principle where the student can take just what he needs in order to complete a requirement rather than requiring the whole program? The returning G.I. may well have spent hundreds of hours in airplane-engine mechanics, while in the service and be deficient, according to tests, in only one or two areas in order to be certificated by the Civil Aeronautics Authority as an engine mechanic. Why make him take the whole course? Why not develop program materials that will enable him to "slot in" or "drop in" for what he needs?

Further, what is so sacred about the "hours" required in certain programs—apprentice-related programs, for example? Here the completion of the "hours" of classroom or laboratory attendance appears to be the objective. Haven't we learned anything about instruction that would permit us to humanize, individualize, and economize our instruction?

Programs and instructional methods must be under constant change in vocational-technical education or we will lag behind rapid change in business and industry. Regional or area curriculum laboratories must be established to assist

in the preparation of software not now available to aid in instruction. It was my hope that this would have been a reality through the new Federal Vocational Education Act, but it has yet to be funded for this specific purpose although approved by our lawmakers.

The last program that I want to touch on is the college parallel or transfer program. It has the reputation of being of greater "quality" or prestige than other programs. We all proudly offer full programs because of student demands and because it is usually the least costly to equip or offer. We assume that because it is "college transfer" or "parallel" it is beyond suspicion and needs little improvement as long as we conform to what the universities say is acceptable.

This is not to say that we should not have standards which enable our successful students to transfer and succeed at the university level. I am concerned, however, that the major portion of our student unrest does not come from the community service or the occupational-technical students. Rather, it comes from the students in the college transfer programs, most often in the humanities area. Claims of lack of relevancy, dull lectures, disinterested faculty and lack of meaningful programs and instruction are what confront us, as administrators.

It is small wonder that the bright student who, as a sixth grader, studied local government by attending city council meetings and making reports, who studied United States history and government through field trips, current problems and discussion, and who listened to tele-lectures by his congressman when he was in high school, is bored and rebellious when the college teacher uses the methods of teaching that have been abandoned in the more enlightened elementary and secondary schools of our country. I do not believe that, in spite of the wonderful work that is being done on many campuses by many faculties, any one of us can feel very secure. There is a great deal of work to be done, and I continue to believe that the community junior college gives the greatest promise for leadership in the improvement of instruction and instructional innovation in all segments of education. We must, however, recognize this as an opportunity and move before it is too late.

DEREK S. SINGER

QUALITY TEACHING AND IN-SERVICE TRAINING

It was Mark Twain who said: "Training is everything. The peach was once a bitter almond. Cauliflower is nothing but cabbage with a college education." Others have defined training both more extensively and more conventionally. For our purposes, perhaps we can best think of educational training as:

> The continuing process of learning new and different skills or of improving and perfecting skills formerly acquired. Training, as distinct from education, necessarily implies a distinctly pragmatic, applied type of learning—not one that is abstract, theoretical or academic.

I have been associated with training programs for adults for many years, both in America and overseas. I have both observed and participated in the training-while-working process for government workers in Vietnam; for foreign trainees from Japan, Taiwan, Costa Rica and the Congo; for American Peace Corps Volunteers serving in Colombia, Tunisia, Bolivia and Indonesia; and, of course, for junior college teachers, counselors and administrators in workshops and short courses in the United States. Clearly and expectably there are many differences among personnel affected by programs as widespread and diverse as these.

However, there are also some significant parallels and similarities. Some of these can be seen by taking a hard look at what in-service training, as a rule, can and cannot do. To begin with, such training, given to professional people after they have begun to work, can often accomplish the following:

a) It can bring the trainee new facts and knowledge to supplement or correct his original store.

b) It can introduce and sharpen trainees' techniques and methods of handling and transmitting information.

c) It can stimulate, refresh and generally expand trainees' professional horizons.

d) It can effectively uncover and help the trainee understand his principle areas of strength as well as his chief weaknesses.

On the other hand, training of working adults usually cannot:

a) Provide requisite basic knowledge and skills for professional preparation.

b) Be successfully applied over an extended period of time in more than one or two key areas.

c) Succeed if trainees are grossly mismatched as to age, background, interests and intelligence. An exception to this would be for skills development programs

given to a highly motivated but disparate group, such as Peace Corps Volunteers, all of whom share an overriding superordinate goal to acquire skills and improve work performance.

d) Solve any deep-rooted personality or organizational problems for an institution, simply by producing "better-trained people," regardless of how successfully such a group's trainees may have performed in training.

THE DIMENSIONS OF THE NEED

Now let us take a look at the special in-service needs of two-year college faculty and staff. According to the AAJC *1969 Directory,* America's junior and community colleges, with nearly 2,000,000 students in their classrooms, now report a combined teaching and administrator total of more than 95,000. Some 84,000 are teaching faculty, and 11,000 are administrators of one kind or another. In other words, about 88 percent of the total junior college staff are teachers, and nearly 12 percent are administrators. These figures include both full-time and part-time personnel. In this regard, there are two full teachers at America's two-year colleges for every part-time one, on a national average.

Comparing data from the 1965 and the 1969 *Directories,* it should be noted that teaching faculty at the institutions listed increased by a whopping total of some 45,000. In other words, the number more than doubled, from 39,000 to 84,000, over the five-year period, while the number of colleges rose from 719 to 993.

Looking at the faculty growth since 1965, there has been an average increase of over 21 percent each year. If that rate continues for another decade, our *1979 Directory* would show about 320,000 institutional faculty, including part-time, replacements and new teachers.

Of course, as Hegel, the German philosopher, once put it, "We learn from history that we do not learn from history." Consequently, it might be safer to take a lower figure, derived from a comparison of instructor-to-student ratios and student enrollment figures, also taken from the AAJC sources. Such a calculation would show a somewhat smaller increase—but still with about a quarter of a million instructors "on board" ten years hence (247,000).

A still lower, more conservative estimate would show some 171,000 full- and part-time teachers at junior and community colleges in 1979. This number is taken from simply projecting ahead this year's (October 1968) faculty increase figure over that of last year.

However viewed, each of these new projections substantially exceeds the basic figure formerly used by those in the field—i.e., "100,000 new instructors will be needed over the next ten years." In fact, we are pretty certain that at least twice that number will be required, even if educational technology, programmed instruction and the like extend the teacher-student ratio remarkably. In plain terms, there is every possibility that the "baby boom" of the '40's and '50's, whose harvest is now being reaped in the colleges, will be equaled or surpassed in numbers by greatly increased enrollments for adult, compensatory, and occupational education. Many of these new students will come from groups and strata hitherto all but untapped. And for teaching them hydroponics or ocean-

ography or woodcarving or watercoloring or English as a second language, plus increased doses of reinforcement, support and counseling, patient and personalized "hands-on" attention from large numbers of dedicated men and women will be needed for a long time to come!

Preparation beyond the Master's

Education was once defined by Ambrose Bierce as "That which discloses to the wise and disguises from the foolish their lack of understanding." However this may be, much has been said and written about the formal education of future faculty members at two-year colleges. Nevertheless, the main purpose of this report is to help illuminate a few dark corners in the "separate but equal" field of professional in-service training. It is chiefly in this sense that I address myself to the issues posed by my topic: "The Preparation of Junior College Instructors beyond the Master's Level."

At AAJC, we have just completed a survey of 288 junior and community college members of the Association on "Priority Needs for In-Service Faculty and Staff Training." This sample amounts to about one-third of AAJC's members and over one-fourth of all two-year colleges in the United States. Results have been separated, calculated, and compared on a national as well as a regional basis.

The questionnaire for the survey was prepared as simply and forthrightly as possible. Earlier this year, we requested member colleges to list the "most-needed courses" for in-service staff training. Each college was asked to list up to three courses, in each of six categories, including academic, vocational/technical, education, curriculum and learning, community junior colleges, administration and supervision, and counseling and guidance.

The colleges were also asked for specific information about preferred conditions for staff training, such as training locations, length of training, time of year for training, possibilities for sharing training costs, the importance of graduate credit for in-service training, and the current availability of such training to meet felt needs.

On a national basis, then, the course categories most in demand can be listed in descending order by number of mentions made, as follows: (1) general education, curriculum and learning; (2) academic; (3) vocational/technical; (4) administration and supervision; (5) community junior colleges; (6) counseling and guidance.

National Summary

It may be useful to look at the top three individual course priorities within each category, as shown by the survey. The breakdown is as follows:

1. *Academic:*
   - Remedial English
   - Remedial Reading
   - Afro-American Studies

2. *Vocational/Technical:*
   - Data Processing
   - Engineering-Related Programs (General)
   - Para-Medical Occupational Programs (General)

3. *Education, Curriculum and Learning:*
   Programmed Instruction
   Testing and Measurement
   Learning Theory

4. *Aspects of the Two-Year College*
   Philosophy, History and Goals
   Community Needs and Relations (General)
   Student Profile

5. *Administration and Supervision:*
   Public Relations
   Principles of Supervision
   Business Management and Planning (General)

6. *Counseling and Guidance:*
   Group Dynamics
   Minority Movements and Problems
   Human Relations

The survey also showed majority preferences for training "on campus," training "during the school years," and in-service training of under two weeks in duration. Some 164 respondents out of 299 indicated a willingness to pay up to full cost for in-service training, and 221 respondents out of 295 consider graduate credit for in-service training either desirable or essential. Of 296 responses, 281 felt that in-service training is either unavailable (124 respondents) or only fairly available (157 respondents).

AVAILABILITY OF TRAINING

What is the actual availability of in-service training for faculty and staff at two-year colleges? In discussing this question, we will include a look at the national picture, which I have drawn from two principal sources of information: (a) the AAJC "1969 Guide to In-Service Training for Two-Year College Faculty and Staff Members"; and (b) awards made this year under the new Educations Professions Development Act (Part E). Several thousand copies of the former document were recently distributed (without charge) to AAJC member colleges, and to many others professionally concerned with the training of faculty members. A total of 204 short courses and workshops for 1969 are listed, basically using the same geographical and subject matter format as the survey already reviewed.

The EPDA listing referred to includes information on some 129 fellowships, institutes, short-term training programs and special projects which were recently approved for the first year of operation of this new Act, administered by the U. S. Office of Education. A total of $2.2 million was earmarked for fifty-one fellowship programs, in all but four of which junior college personnel may participate. And $4.7 million was set aside this year for seventy-eight institutes and workshops, through which as many as 2,750 two-year college people may receive training.

COSTS AND EDUCATION

If America's two-year colleges get the precise training they want and need for their teachers, somebody is going to have to pay for the instruction provided.

Assuming the annual growth rate of 11.4 percent, there would be 255,000 instructors listed in the *1979 Junior College Directory*. Based on an average of one month of professional training every other year to upgrade, refresh or "retool" the skills, knowledge and relevance of these teachers, somewhat over $625 million will be required for in-service training during the next ten years. This calculation is based on the costs of five months of instruction at $500 per month.

If the higher faculty-growth-rate figure is used, over $1.1 billion would be needed to support in-service training. Using the middle figure, we can "split the difference"—and plan on a training bill of some $860 million.

Let me now comment on preservice preparation of faculty for two-year colleges. Much of our information in this vital field is derivative and even anecdotal. We do possess reports and studies on models and samples of preservice instructor programs which are rapidly proliferating throughout America. However, the AAJC position on these programs so far has developed only to the extent of allowing the following observations:

Considering the broad scope and plurality of objectives at "democracy's colleges," it seems both proper and inevitable that the methods and content of programs to prepare instructors should also be flexible and varied. Experimentation, diversity and pragmatism are hallmarks of the community junior college movement. The same qualities should be evident in programs to provide professional preparation for its new faculty members.

Many colleges and universities train both two- and four-year college teachers together. Others follow a policy of dividing and then training graduate students in different post-secondary education fields, offering distinctive curriculums, programs and even degrees to various categories of students.

Whatever approach is taken, AAJC believes that certain elements can now be identified which are common to most relevant, responsive programs for the preparation of tomorrow's faculty for the nation's two-year colleges. The absence of such characteristics may indicate that a preservice training program does not provide the best kind of preparation for effective teaching in today's junior or community college.

The Association feels that heavy stress must remain on a quality graduate curriculum in the future teacher's major disciplinary field(s), whether academic or vocational. The manner and timing in which such substantive course material is presented can be of great significance. AAJC works closely with professional groups in many key subject-matter areas, helping to set guidelines and encouraging improvements in these areas.

Yet, considering the expanded responsibilities of America's two-year colleges, there should and must be other important considerations in preparing the future teachers. The Association encourages multiple training models and approaches. However, it also recommends that preservice training of future faculty for its member colleges should include certain particular elements. Among the central factors to look for in a well-conceived preservice training program are:

1. The historical role of the two-year college and its future place in American higher education.
2. Modern learning theory, including the uses and limits of educational evaluations, testing, and measurements.
3. The theory and techniques of curriculum development.
4. Elements of student guidance and counseling.
5. Knowledge and practice in school administration, to make campus communications easier, to facilitate teacher participation in campus governance and related activities, and to help prepare faculty for administrative jobs later on.

6. The profile, culture, goals, and values of the diverse students population at today's junior colleges.
7. An opportunity for substantial, relevant supervised practice teaching or internship at a two-year college.
8. Construction and use of programmed curriculum and other innovative instructional techniques.
9. Handling modern media and "educational hardware," including its integration with traditional teaching methods.
10. How to define, implement, and measure specific goals for student learning so as to reach clear, measurable learning objectives within a definite period of time.
11. The ability to locate and apply resources to help define and meet the socioeconomic needs of a college and neighborhood. Actual work experience and involvement in a community project. Practical application of experience acquired to improve teaching and student communication.
12. Interdisciplinary coordination of instruction in teaching "core" subjects, so as to reach students with widely different abilities, backgrounds, and goals.

SUMMARY AND CONCLUSION

Both the national and the regional pictures of in-service training, or "faculty development," are in a state of flux for nearly 1,000 two-year colleges in the United States, which reach nearly 2,000,000 students. Available data indicate that neither the universities nor the Office of Education programs so far planned or announced are filling an appreciable amount of the short-term, in-service training demand which has been generated from a rapidly growing number of junior and community colleges. Also, only a minute proportion of the funding required is now available for training the 84,000 men and women who teach at the two-year colleges. From my perspective, the best and perhaps the only answer seems to be a massive, practical commitment by public and private groups to the need for more effective, more meaningful, and more relevant training. Remediation, engineering, programmed instruction, community college background, administration, modern group-counseling techniques, and the other priority "felt needs" at these colleges must be recognized and must receive priority from our colleges, our universities, and other traditional sources for professional improvement. Both the job and the stakes are simply too big and too important to slough or or let slide.

We hope that universities and other four-year colleges can take on this task with us. But if they cannot or will not do it, if they turn a deaf ear or give a "we know better" answer to us when assistance is sought, then the two-year colleges can and must look elsewhere. That look might be toward the powerful new learning corporations, toward new foundation-directed approaches, or even toward a mobilization of our own internal resources and a decision to walk our own path, and go our own way, through an independent Junior College Training Institute.

SECTION II

Sources of Assistance

JOHN I. GOODLAD

ELEMENTARY AND SECONDARY SCHOOL TEACHING: IMPLICATIONS FOR THE JUNIOR COLLEGE*

My charge is clear. I am to discuss recent changes and proposals for change in elementary and secondary education and their possible implications for the junior college.

THREE REALITIES: BACKGROUND OF EDUCATIONAL REFORM

The twelve years from about 1957 to the present represent a period of very intense efforts to improve the schools. As we look at this period in perspective, these efforts appear to be, in part at least, a response to certain realities of our time—realities which help to define the nature of the educational gap with which our schools and colleges must come to deal vigorously and imaginatively. Three of these realities are worthy of documentation. First, we must pay attention to the fact that it is more difficult today than at any time in mankind's past to bring men into possession of their culture. A second compelling reality for our schools and colleges is that today, more than ever before, we possess a significant body of lore about individual differences. A third reality to which our schools and colleges must respond grows directly out of the quantitative success of our great experiment in mass schooling. The very massiveness of our educational effort has been deleterious for many of the young in that they have not developed an adequate sense of identity and of being valued as human beings—that is, valued by persons over the age of thirty, who seem to be in control of things, and valued by themselves.

One could identify eight or ten major realities of this kind to which schools and colleges have been responding, but for our purposes, I would like to develop briefly just these three. The three sets of innovations to which I will then address myself are responses to these realities of our time.

Let me repeat the first—it is more difficult today than at any time in mankind's past to bring men into possession of their culture, that is to say, into full comprehension of the world created out of the perceptions of men. The cause is often given as "the explosion of knowledge." The explanation is not that simple. Our culture is created by men. It is not something *out there*. True, man is creating knowledge today at an accelerating rate, intimidating those of us who must transform it for the education of our people. But knowledge consists of *what* and

* This article is a transcription of a telelecture delivered by Dr. Goodlad.

how man perceives and can change—sometimes so completely that the social dislocations are profound indeed. A dramatic example of this was the work of Darwin, which was responsible for setting off one of the most famous court trials in human history. It is almost unbelievable that there are places in this country where the open teaching of Darwin's theory of evolution is considered a dangerous innovation equated with godlessness and in defiance of Christianity. Similarly, one finds it hard to fathom that there are individuals for whom the mere mention of Sigmund Freud still brings forth responses indicating a subtle but deep fear of the implications of Freudian theory. These are frightening ideas to many people, but they reflect the growth in knowledge and changing perceptions in our culture.

A prime function of education and, therefore, of our schools and colleges is to bring men into possession of their culture. We are not likely to fulfill this function well when we view schooling as merely the coverage of uniformly approved bodies of material. Nor will we fulfill this function when we view thinking for one's self as something which should come later, with maturity, instead of now at whatever age the individual may be. The curriculum is, therefore, clearly a major focal point in determining the extent to which young persons are brought into possession of their culture. The curriculum, therefore, must respond. The curriculum must be continuously rejuvenated through innovations, now more urgently than yesterday.

The second compelling reality introduced earlier is that today, more than ever before, we possess a significant body of lore about individual differences. This human variability demands educational alternatives. To expect elimination of this variability through education is to expect what never has been and never will be. To expect an increase in the expression of this variability through education is to expect what has been, what will and, in fact, must be. It is also clear that increasing educational opportunity to deal with such variability will accelerate cultural evolution; and institutions *must* deal with this cultural evolution.

In recent years, the organization of the school has been manipulated in order to provide better for the wide range of traits characteristic of any group of learners. Patterns of organizing the school have been changing and will continue to undergo revision.

The third aspect of reality to which our schools must respond grows out of a quantitative situation. The massiveness of our effort has been deleterious to individuality. A prime function of schooling is to prepare the individual for lifelong learning, for self-propelled education in which the self educates the self. We are not likely to fulfill this function when we give students no experience in planning and conducting their own education now, nor when we regard students as the passive recipients and educators as the active transmitters of all educational largess.

The assumption of many of today's innovators is that the alternatives in school pharmacies do not adequately cope with compelling realities such as the three briefly summarized above and that there simply are not enough alternatives in the pharmacy. The varieties of substances in the educationals bottles on the shelves do not nearly meet the variety of demands that must now be met.

Coping with the Culture: Patterns of Curriculum Organization

Let me review a few of the alternatives in elementary and secondary education. I have referred to the fact that changes in the curriculum must be designed to help individuals cope with their culture. At the elementary and secondary levels, these changes have been aimed toward two objectives—first, bringing disciplined order out of massive accumulations of knowledge and, second, introducing the student to the reasoning, exploring, and discovering processes of the scholar. We want the student to reason for himself and to realize that he, too, can create, not merely consume, knowledge.

One of the directions of curriculum reform in elementary and secondary education of the past decade has been that of striving for more fundamental elements around which to organize the specifics of the curriculum. We recognize that the specifics of the curriculum often are out of date even as a student is learning them. Therefore, we need to seek for more fundamental skills, concepts, values—a more basic set of elements, which will endure perhaps twenty to thirty years rather than becoming obsolescent in a very few years, as do isolated facts. We have been seeking a more basic set of organizing elements around which to build the curricular experiences which students are to have.

The second direction of curriculum reform has been to teach the student the process of learning; that is, to teach him to inquire for himself. A key curricular idea of the past decade pertains to the structure of the disciplines. If one learns the structure, he will be able to cope with new knowledge. If, on the other hand, all one does is to cope constantly with the bits and pieces, he will never learn to deal with new knowledge effectively. The second idea stresses the importance of intuitive learning. This involves examining knowledge and making intuitive leaps from segment of knowledge to segment of knowledge in order to evolve principles by an inductive process.

The error, I think, during the past ten or fifteen years is that we have attempted to reorganize the length and breadth of the curriculum around a common set of ideas without recognizing the fact that there are, indeed, good arguments for several different approaches to the curriculum. For example, if you and I were to engage now in proposing that the curriculum be organized entirely around societal problems, we could come up with a rather impressive organizational framework and, if applied, an impressive curriculum. Similarly, we could come up with a strong argument, one I have just discussed, regarding the desirability of organizing the curriculum around academic disciplines. But the difficulty here is that, if we use any one of these approaches throughout the whole length and breadth of the curriculum, the student is exposed to only one pattern of organization and is both unaware of other possibilities and deprived of these alternatives.

Recently, a student about to graduate from UCLA came to see me, generally unhappy with her four years of higher education. As we began to talk about the limitations of organizing the curriculum around political science, sociology, psychology, history, and biology and all the rest, she said, "Oh, you sound like all of the idealists. There is no other way to do it." I was struck suddenly by a realization that this young lady had been exposed to only one pattern of organizing the curriculum. She was a product of recent emphases in curriculum

organization. She had never heard of core curriculum; she had never heard of the possibilities of organizing the curriculum around problems of the society, or problems of the students. She was aware only of organizing the curriculum around the problems of the discipline. It is unfortunate for students to come through eight, or sixteen, or twenty years of schooling and be unaware of the fact that there are several viable ways of organizing the curriculum. I believe that students should be exposed to several of these patterns, each based on differing assumptions about how best to open up the culture for comprehensive understanding.

An alternative to monolithic patterns of curriculum organization is curricula organized in phases of schooling lasting from two to four years. During a given phase, we would emphasize a certain pattern of organization which would be countervailing to the preceding and succeeding patterns. This, it seems to me, begins to lead us into some of the questions of the junior college. Can the junior college be defined and developed as a unique phase of education? What shall we assume about the student and his exposure to his culture? Is he coming reasonably to grips with it? Does the student still need to be helped to humanize content? And by humanizing content, I mean organizing it so that he can absorb it and deal with it. Should we be assuring the student at the junior college level some control over his culture—for example, through work? Shouldn't he be able to master some vocation in such a way that he gains control over a corner of his culture? Should we, at the junior college level, be primarily concerned about helping the student to be critical of his culture? Should the student during the junior college phase be primarily contributing to the culture? Should we be organizing the curriculum of the junior college around the disciplines? Around problems of earning a job? Around special interests? Should we be providing each student at the junior college level with some special competence such as art or music or literature or some other? Frankly, I am not at all sure that the junior colleges have yet defined functions with respect to the curriculum. And if the junior college is now going to move toward a pattern of curriculum organization which is merely an extension of what has preceded or what is going to follow, it will be losing its unique opportunity.

I believe that we are about to enter a new era in curriculum organization. We are becoming discontented with an era during which the curriculum has been organized around the academic disciplines. I believe—and hope—that the excesses or curricular reform in the future, however, are going to be excesses rising out of a curriculum oriented to social problems. If this is going to be the curriculum of elementary and secondary education, should the junior college merely perpetuate a socially oriented curriculum or should it be pursuing different patterns? I do not know the answer. I am no expert on the junior college but I would like to suggest that the junior college, in curriculum reform, should in some way be countercyclical to the curriculum of the high school. It should not be an extension of the high school. It should be countercyclical to what it follows and countercyclical to what it precedes. To be an extension of the high school is a mistake; to be merely the beginning of a four-year college is likewise a mistake.

Providing for Individual Differences: Innovations in School Organization

A second area of educational reform during the past decade is that of school organization which has been designed primarily to meet the range of individual differences identified in students.

There are two ways of looking at individual differences. One way is vertical; the other is horizontal. Let me indicate what I mean by vertical differences among human beings. When we look at any trait in the human being—whether artistic performance, mathematical performance, or the ability to run a mile—human beings are seen to vary widely from one to another along the continuum. A significant insight in education over the past decade is the recognition of the fact that we must not evaluate individuals only by their location on any continuum. Instead, we must provide each individual with the opportunity to grow from wherever he is on that continuum. Thus, in dealing with human beings in groups, we must lift the ceiling and lower the floor of expectancy within the group in order to deal with all of the individuals in it. Some of us call this process nongrading. Nongrading has been a significant innovation in elementary and secondary education beginning about 1939, fading during World War II, coming into visibility again about 1955 and moving rather rapidly during the subsequent period of time. Nongrading is a process of removing the ceiling so that we take the pressure and limitations off the student and permit him to advance at his own speed. Nongrading involves few of the expectancies that we have had before. It involves looking at the curriculum from the point of view of continuums of learning—basic values, concepts, skills. It means providing a wide range of materials to cope with individual differences in the group. It means, especially, removing the grade-based norm and replacing it with criterion-referenced standards. In this way, we can measure the individual with respect to a criterion about which we are concerned, such as the criterion of being able to read, the criterion of being able to engage in quantitative manipulation, the criterion of being able to understand social phenomena or whatever is appropriate. We would no longer appraise an individual's progress in relationship to how he compares with others or with a group-based norm.

Now, what are the implications here for the junior college? I am not at all sure that junior colleges have faced up to the enormous range of vertical differences in the human beings coming to them. When human beings arrive at the junior college, the standard variability probably is from eight to twelve years of attainment in any field of endeavor. Providing for these individual differences is going to be enormously difficult because the junior college has only a two-year span of schooling in which to do so. Nongrading would loosen up this structure and facilitate extending the range of learning opportunities to approximate the range of student variability. A few four-year colleges have considered this. Recently, Harvard introduced freshman seminars which were nongraded and open to all students in the college regardless of their classification.

Other kinds of individual differences may be classified as horizontal. When we think about vertical differences, we are thinking about differences in degree. For example, the vertical differences found between individuals in quantitative learnings in mathematics are differences in degree of comprehension. But what about the differences which exist among several traits within an individual? We

know when a human being responds to the graduate record examination, for example, he might very well be at the 98th percentile in mathematical performance and the 42nd percentile in linguistic performance or vice versa. As a human being grows older, the differences within him from trait to trait become greater until in time he seems to be as varied in his own traits as any group of which he is a part. An individual tends to practice his areas of expertise and to ignore matters for which he has little expertise or interest. Consequently, then, he becomes increasingly varied—very competent in bridge, unable to play chess; competent in swimming, unable to run very fast; very competent linguistically, not at all competent mathematically. These differences become more and more pronounced within the individual as he matures.

Clearly, then, one of the most profound needs of education is to diagnose the variability within the individual as well as within the group. One way for doing this to create team-teaching situations—situations in which groups of learners are taught by groups of teachers of varying kinds and varying levels and types of competency. In team teaching, it is possible to have a single individual instructed by one teacher or a group of thousands listening to a speaker. Sometimes, it makes little difference whether one is speaking to a million people or merely to hundreds. Team teaching, then, makes possible many different sizes of groups. Certainly, it suggests a different kind of physical plant: a place for the individual to work by himself, or a building in which an individual can listen to a lecture being delivered simultaneously to hundreds or even thousands of people.

Team teaching takes many forms. One instructor supported by a half-dozen aides could be working with 150 students in one subject area. Or, with team teaching, several teachers could be guiding ten or twelve or fifteen different learning activities simultaneously. One of the significant aspects of team teaching is that it makes possible the use of a hierarchial team of instructors: master teachers, paraprofessionals, student teachers, aides, and others. Exceedingly varied instructional patterns become possible.

What are some of the implications for the junior college? College teaching is an isolated kind of activity. The pattern in college teaching generally is a teacher with a group of students in a cell isolated from all other cells. It usually is difficult to bring together a group of instructors who are having the same kinds of problems. Team teaching at the junior college level could provide a cluster of instructors to cooperatively plan the curriculum for a segment of the student body. They could be observing each other, teaching together, or planning for a large group of students in a collaborative kind of environment. Colleges, as I know them, are not marked by such curricular planning.

A significant problem of our time is that of offering access to college teaching for various groups who, until now, have been denied entry. By bringing them into a team as paraprofessionals or as interns, it may be possible for us to extend college teaching to include persons who have not sought this opportunity up to now.

Promoting Individualized Learning: Instructional Innovations

Let us turn to instructional reform designed to deal with human anonymity at all levels of education. Some of it has been aimed at improving the indi-

vidualization of learning. Significant are programmed and computer-assisted instruction designed to encourage individuals to go through common bodies of material at differentiated rates. Some of the claims made for computer-assisted instruction are perhaps overdrawn. Much experimentation lies ahead. And some technological difficulties are yet to be overcome. Nonetheless, the computer offers us a relentless, indefatigable, individualized instructor. It provides not only the opportunity to individualize rates of speed but, ultimately, the more enticing possibility of providing differentiated kinds of learning for students of different interests.

A contribution of the past decade in regard to the individualization of instruction has been the development of materials to take care of individual differences. Such instructional materials are designed to be responsive to the aspirations of the student. The talking typewriter is an example of such responsiveness when it enables the student to control both his own input and the output from the machine. These are materials which have enabled the student to manage his own learning and which have extended the range of stimuli to all of the senses. We have had experimentation, also, with materials providing alternative means to common ends—for example, books of differentiated difficulty dealing with essentially the same subject matter. And there are materials which free the teacher from burdens of routine correcting and testing. The implications in all of these approaches are relatively clear for the junior college and, in fact, the junior college has been an innovator in developing materials of this kind.

Another area of innovation has been that of teaching students and teachers to be more precise in setting behavioral objectives for a particular unit or segment of learning. The work of some of my colleagues in the junior college field is worth noting. They have been teaching future teachers of the junior college to specify behavioral objectives, to select learning opportunities to achieve these objectives, and to develop precise instruments for evaluating progress. This kind of educational change increasingly is taking place at all levels of education.

In brief summary, we have had curricular reform to help students cope with the complexities of their culture, particularly with the explosion of knowledge; curricular reform to identify more fundamental elements around which to organize experience; and curricular reform to improve processes of inquiry into the various disciplines of knowledge. We have had some reorganization of the school environment based upon our understanding of individual differences, reorganization designed to raise the ceilings and lower the floors through nongrading and to improve provision for the range of individuality through team teaching. And, finally, we have had changes designed to help individualize instruction—changes in materials, changes in the media of instruction, and changes toward the more precise definition of ends and means.

THE CHALLENGE OF CHANGE

We must not conclude from the foregoing that widespread change has occurred recently throughout elementary and secondary schooling. My colleagues and I completed a study of 250 classrooms in the United States to see the extent to which the changes I have been discussing have made an impact on the schools. We concluded that much of this educational reform has been blunted on the

classroom door. We did not find the provisions for individual differences which we had anticipated. Nor did we find in these schools, selected from fourteen major population areas of the United States, a wide range of instructional materials in use. Instead, we discovered that the textbook is still the predominant medium of instruction. We did not find inductive processes of teaching and learning. Instead, we found teachers telling and questioning students, and interaction pattern of teacher to students and students to teacher, not clusters of students discussing their problems together.

We tried to speculate on the reasons for this state of affairs. We hypothesized that there is no continuous, systematic planning for educational change. Change tends to be sporadic. We are putting a thin layer of innovations over traditional ways, instead of rethinking the educational process. There are very few outstanding models of changed schools. Teachers do not know how to individualize because they have not seen adequate examples of individualizing instruction under way.

Change is a very threatening thing. Many people prefer not to change. We need to support and strengthen the spine of those who show some readiness to depart from traditional ways. We need to create strategies deliberately designed to bring about change in schools and colleges.

My colleagues and I have been experimenting in a venture which we call the League of Cooperating Schools. Here we have been attempting, in one school from each of eighteen school districts, to provide external support to schools seeking to effect change. The support provided comes from a new structure, external to the system of which the schools are a part. It is my understanding that the League for Innovations in the Community College, with which many of you are familiar, has been similarly created to promote change in those junior colleges which seek to innovate; to bring about changes, which support the findings about education that have been coming forth during the last decade or two. We need to find ways of intervening in order to provide support for those who seek to bring about change, support which will enable them to avoid a collision course.

The junior college has an unusual opportunity to develop new educational alternatives because it is itself an alternative. It can choose merely to parallel the first two years of the four-year college and to be, therefore, only a geographic alternative. Or, it can choose to be a unique institution, geared to the educational needs of the clients and larger society it serves. I trust that those leading the field of junior college education do not regard this as a real choice.

PRESTON VALIEN

THE OFFICE OF EDUCATION AND THE IMPROVEMENT OF JUNIOR COLLEGE INSTRUCTION

The Office of Education is keenly aware of the potential of junior and community colleges and hopes to effectively implement existing and future Federal legislation to help the colleges to achieve their goals. On a number of occasions both HEW Secretary Robert Finch and Commissioner of Education James Allen have indicated their beliefs that the future of American education is bound up nationally with the continuing evolution of the two-year community college.

One of the Office of Education's high priorities is to help improve instruction in two-year colleges. The rapid growth of junior colleges and the ever-increasing demands for trained faculty and administrators will be a national problem for years. The Education Professions Development Act of 1967 is perhaps the best vehicle by which the Office of Education is able to contribute to the improvement of junior college instruction through training of existing and recruitment of new personnel.

The purpose of Title V, Section 501 HEA-EPDA is to improve the quality of teaching and to help meet critical shortages of adequately trained educational personnel by (1) developing information on the actual needs for educational personnel both present and long-range, (2) providing a broad range of high-quality training and retraining opportunities responsive to changing manpower needs, (3) attracting a greater number of qualified persons into the teaching profession, (4) attracting persons who can stimulate creativity in the arts and other skills to undertake short-term or long-term assignments in education, and (5) helping to make educational personnel training programs more responsive to the needs of the schools and colleges.

Parts C, D, E, and F of this Act provide opportunities for training, retraining, and upgrading skills of junior college personnel. Parts C, D, and F support programs for vocational education personnel at the elementary and secondary level as well as post-secondary level. Part E supports training programs for higher education personnel. A strong point of this act is its flexibility. Short-term institutes and special projects as well as yearlong institute and fellowship programs may be supported. The national priorities for Part E of EPDA reflect a commitment to improve junior college instruction. The Part E national priorities are:

1. The training of educational personnel to serve in two-year colleges.
2. The training of teachers and others in higher education who are concerned with the needs of students from educationally or socio-economically deprived backgrounds.
3. Programs to train educational personnel to serve in developing institutions.
4. Training programs for administrators in higher education.
5. Programs to train educational specialists.

The Office of Education is concerned about training personnel to work with students from educationally or socioeconomically deprived backgrounds. For the two-year college this problem has two sides. First, it is difficult to find the professional expertise to conduct these programs. There seem to be very few educators with this type of expertise. Second, there is evidence that junior colleges are not educating a significant number of poor youth. A recent Office of Education Task Force report on the junior and community colleges stated:

> The poor youth's chance of attending a community college is only one-fourth that for the non-poor youth. Only 5.5 percent of the junior college population comes from poor families.
>
> Opportunity would be fully equal only if 600,000 black students (plus an undetermined number of Indians and Mexican-Americans) were going to college now.

Many of our urban community colleges such as those in Los Angeles, Oakland (California), Chicago, and New York enroll a significant number of educationally and socioeconomically deprived youths but we must note that these youths have a nationwide dropout rate of 90 percent. You can see now the enormity of the problem of educating these youths. I am hopeful that some of the innovative techniques of learning that are being encouraged by the efforts of Dr. Johnson and the League for Innovation in the Community College will provide workable models for improving junior college instruction for deprived youths. Individualized learning, implemented by auto-tutorial and other systems, will perhaps be a major solution to this problem when these approaches are tested and thoroughly validated.

Another Federal program which I believe has contributed significantly to the improvement of junior college instruction is that authorized by Title III of the Higher Education Act, Strengthening Developing Institutions. Twenty-three percent of appropriations under this program are earmarked for two-year colleges. The Office of Education is thus permitted to assist institutions to meet wide spectrum of their program needs. The support of National Teaching Fellows under this title has significantly contributed to the improvement of junior college instruction. One program which is funded for this coming year under Title III will benefit fifty-three junior colleges. It is a faculty development program, implemented with the assistance of the American Association of Junior Colleges, which will permit the participating colleges to attack their own deficiencies in faculty development, with the goal to improve instruction. Evaluations of programs such as this will hopefully develop a large body of knowledge that can be used to improve junior college instruction.

Title IV-D of the Higher Education Act Amendments of 1968 authorizes monies to support the planning and development of cooperative education programs. The educational value of cooperative education has been established

by the successful programs at Antioch, Wilberforce, Northeastern, the College of San Mateo, and Mohawk Valley Community College in New York.

There is evidence of strong commitment to junior colleges in President Nixon's fiscal year 1970 budget. This evidence is presented in Mr. Nixon's proposed appropriations for higher education facilities. As you may know, the only direct grants for higher education facilities contained in the proposed budget are for facilities grants for junior colleges to the amount of $43,000,000.

The Office of Education administers many other programs that directly or indirectly benefit junior colleges. Indeed, our junior college task force identified at least fifty-eight such programs. Let me discuss for a moment research in the junior college. The Office of Education's Bureau of Research supports activities such as the ERIC Clearinghouses, and regional research laboratories. It is becoming clear to us in Washington that many junior colleges, especially in large districts, are developing the staff capabilities to do meaningful research, which I hope will result in proposals to USOE. Such research is another means for finding some of the answers to the vexing question of how to improve junior college instruction.

The Office of Education's concern for improving junior college instruction is evident. But what are some of the things we look for in a program with such a goal? First of all, if one is to improve instruction, one must be able to identify what is weak in the instructional process, then develop sound methodology for overcoming these weaknesses. Sound methodology implies that certain goals will be established as criteria for success. The Office looks for programs that can be used as models and which have a multiple effect. Permit me to give you an example of my point. Recently the Office of Education granted $48,000 under Part E of the Education Professions Development Act to Frederick Community College in Virginia to make it possible for all the public community colleges in Virginia to undertake a staff and faculty development program. The Virginia Department of Community Colleges will administer the grant. The program will consist of institutes for new faculty and staff, board members, deans of administrative and financial services, and educational media specialists. Support will be provided for part-time graduate study by community college faculty. We hope this effort will provide impetus for similar programs in other states.

Granted that good instruction is the key to good learning, in the comprehensive community college we know that community services, adult education, and vocational education must be of vital concern for this institution to fulfill its role. Recognizing the vital role that two-year institutions are and will be playing in educating citizens of all ages, the Office of Education appointed a task force which has thoroughly analyzed not only the role of the two-year college but also has offered an analysis of the federal government's relationship to this role. The American Association of Junior Colleges participated in the prepartion of this report and it is now being given careful consideration. The introduction in the Congress of the "Comprehensive Community College Act" by Senator Harrison Williams of New Jersey is evidence that there is also definite political concern about the future of the two-year college.

We should not become enmeshed in supporting junior and community col-

leges merely for their own sake. I share Commissioner Allen's feeling that we should be concerned with the impact of programs at all educational institutions. Earlier in this conference we participated in a discussion of "Elementary and Secondary School Teaching: Implications for the Junior College." Education, it is clear, is a continual process from birth to death. Therefore, different segments of the educational system must interact so that this process does become truly continual. Interaction is especially needed between elementary and secondary schools and junior colleges. We accept the fact that the junior college has a big job to do with educationally and socioeconomically deprived citizens. This task is frequently complicated by the inadequate educational experiences that youth undergo in elementary and secondary schools. Articulation, interaction, and a true sense of cooperation between junior colleges and elementary and secondary schools is a must. Junior colleges may find it necessary to take the initiative in establishing this interaction, rather than assuming that such initiative will come from the public schools.

What is the relationship in this continual educational process between the junior college and four-year colleges and universities. Studies of the transfer student have been conducted nationally, in states, regionally, and locally, showing that significant articulation is taking place with regard to movement of two-year college students to four-year colleges. But what, if any, articulation is necessary between two-year and four-year colleges with regard to occupational education students. We know that many junior college students who complete occupational education programs transfer to four-year colleges. This is especially true in business and several of the scientific technologies. Perhaps there is a responsibility for four-year colleges to become more comprehensive. Recent developments in two of our major urban centers indicate that this approach is at least being given a try. Federal City College in Washington, D.C., and the proposed four-year community college in the Bedford-Stuyvesant section of Brooklyn, New York, will be, if fully and effectively implemented, comprehensive institutions. Secretary Finch has said of Federal City College:

> It is the community's own college, consciously related to the particular problems of life in the nation's capitol and frankly of service to the disadvantaged among its people. It is, on the drawing board at least, a full-spectrum college of science and humanities—yet its orientation doubtless will always remain, in considerable part, vocational and paraprofessional.

I suspect that the proposed four-year college in Bedford-Stuyvesant will, if implemented, be somewhat similar to Federal City College. Although junior colleges have a tremendous potential to serve the total educational needs of urban centers, four-year community colleges may provide additional assistance in the battle to save the cities.

One further comment on the junior college and the urban centers. I am disturbed by the fact that 53 of the 130 cities in this country with populations of 100,000 or more do not have public two-year colleges within their city limits. The cities, states, and the federal government have a responsibility to find solutions to this problem.

Let me return to the topic of junior college instruction. The true test of

effective instruction in junior colleges will be when their very high attrition rate (variously estimated between 67 and 75 percent for all students and up to 90 percent for disadvantaged youth) is drastically reduced. Until this occurs we cannot help but feel that there is something wrong with our instructional programs. If new methods, such as emphasis on individualized learning, are needed to help students who need extensive remedial work, then these methods should be undertaken immediately.

WILLIAM H. STANLEY

STAFF INTERPERSONAL RELATIONSHIPS: A BASIS FOR INNOVATION AND EXPERIMENTATION IN JUNIOR COLLEGE INSTRUCTION

At El Centro College we seek to develop a self-reliant, inquisitive, "self-actualizing"[1] individual who is aware of himself, of others, and of a society which survives only because it is able to change. We would hope that this individual will not only be capable of reacting in a changing society but will be active in instituting change predicated upon the assumption that man has the ability to make a better world for himself, and the ability to become aware that his own welfare is inextricably interwoven with the welfare of others. Further, our assumption is that man can learn to become almost anything. Our commitment is to assist him to become his best "self."

Of course, we recognize some of the limitations that are placed upon a two-year commuter college with a transient population. We do not consider that we are in this effort alone, but we are pragmatic enough to recognize that the here and now is the only opportunity in which we have to work. We are dedicated to making the best effort that we can. Realistically, we recognize the many limitations which may constrain us, whether these limitations are our own humanness or external factors with which we cannot expect to cope.

We have defined our efforts in two dimensions: one is to try to be definitive about what we teach the student to do; the other is what we do to assist the student to become his best self. Necessarily, both of these are highly interrelated, but I shall emphasize the latter.

Most educational experimentation has proceeded upon the assumption that the acquisition of certain bodies of knowledge and the mastery of certain skills automatically results in making the whole person. This is an assumption which is presently being questioned. But most learning experimentation has revolved around how to learn better that which we have determined "a priori" should be learned.

THE CURRENT EMPHASIS IS SUSPECT

The emphasis we have placed upon the formal curriculum, programs, strategies, methodologies of instruction, and the administrative features of education

[1] Abraham Maslow, *Toward a Psychology of Being* (Princeton: D. Van Nostrand, 1962).

is indeed suspect. Stephens,[2] in his investigation of experimentation in education, reports that it is very difficult to attribute superiority of one method, one strategy, or one organization over that of another. Inconclusive factors appear but one is not able to proceed in one direction or another with great confidence of its superiority.

Investigations of our own experimental programs do not seem to justify unequivocal judgments. We organized a group of courses into a quasi-team-teaching situation and found significant positive differences in favor of students who had taken English and history in this organization.[3] We cannot be certain about causal factors. It may have been the organizational structure or the methodological approach or both; or it may have been the result of the personal qualities of the two teachers involved. Our research design does not permit more than speculation.

We extended the time of some of our beginning English classes for low-scoring students from three hours per week to five and reduced the number in the class by five. We know that the students who participated in this program achieved in a subsequent English course much better than predictive factors would indicate, but again we have not controlled enough of the variables to be definitive about why.

We view our Audio-Tutorial Biology Laboratory with enthusiasm and know that, generally, our students learn as well in this setting as they do in conventional settings. We have objective evidence that this procedure allows the student to use his time more economically, but we are also aware that many rather minor modifications of conventional approaches would also permit more economical use of time.[4]

Perhaps the most important thing that we learn from present research concerning learning and teaching is that one may devise new approaches, employ different materials, and develop different organizations without fear of damaging greatly the educational development of the student. This within itself should be a liberating factor in the development and institution of innovative attempts.

INNOVATION AND EXPERIMENTATION

We have assumed that innovation and experimentation are not only desirable but necessary. We have recognized that in a changing, evolving world we, too, must change. We view change as being not only the institution of new programs, but a reevaluation of old programs in terms of purpose, content, and the methodologies employed to teach them. Effective innovation must evolve primarily from the teacher. Administrators and other professionals may stimulate innovation, but its focal point is with the teacher in relation to the student. We do not believe that "packages of innovation" can be handed to teachers with great expectation of success.

With the commitment we have to innovation, the question immediately arises

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[2] J. M. Stephens, *The Process of Schooling, A Psychological Examination* (New York: Holt, Rinehart, and Winston, 1967).

[3] Alvin T. Bean, "Some Comparisons between Conventional College Teaching Methods and a Composite of Procedures Involving Large Lecture Groups, Seminars and Reduced Class Time" (unpublished doctoral dissertation, North Texas State University, Denton, 1969).

[4] Carlos Gonzalez and Gayle Weaver, "The Audio-Tutorial Biology Laboratory" (unpublished report, El Centro College, Dallas, Texas, 1968).

concerning what kinds of people are necessary to implement our goals and what kinds of environments we should provide in order to encourage our staff. We need to recruit flexible, creative, self-actualizing, independent personalities who wish to enter into an adventure in education as well as a career. We feel that we have had some success in the employment of a large number of teachers who really are interested in people, new ideas, and new approaches.

The responsibility of administration to provide an environment which supports innovative attempts in a tangible recognizable form is inescapable. Some innovation can and does occur as the result of the teachers' own creativity, but for it to have magnitude, creativity must be supported with money, time facilities, equipment, and—as important as these items—administrative behavior. Sills[5] has reported that the day-to-day decisions of administrators are a most important factor in the identification and achievement of the real institutional goals. One of the big problems that administrators have is getting accurate feedback about how their behavior is affecting their staff. Another is being well enough acquainted and open enough with staff members to know what the problems, aspirations, desires, successes, and failures of staff members are. Obviously, with this set of circumstances and the credo to which we have committed ourselves, our primary problem is to devise a way in which communication between faculty and the administration and among faculty can become a free, open system in which great mutual trust is present; one where ideas can be shared and where behavior can change in a natural, unthreatening process.

Given this set of circumstances, it was inevitable that we consider "sensitivity training" as one of the avenues to accomplish our objectives. A number of our administrative staff had been involved in sensitivity-training experiences and this provided the impetus for us to develop an "in-house" sensitivity-training experience for all of those on our staff who desired to participate. The initial experience included all of the administrative staff: the president, deans, associate deans, division chairmen, and a few teachers and counselors. Attendance was by invitation and no one was required to attend who did not wish to do so. The opportunity was subsequently extended to all members of the faculty and counseling staff. Over one-half, about one hundred teachers and counselors, have participated.

THE LABORATORY PROCESS

There are some things which we think we have learned that have implications for the learning-teaching process. In the laboratory process each person discovers for himself in what ways he will change. Each takes primary responsibility for discovering and developing his own way of coming into the group. In the classroom situation, each student ultimately must accept responsibility for how and what he will learn. Important questions arise with the acceptance of this condition. How does the teacher function? What specifically does he do to help establish a climate of openness, enthusiasm, and receptivity that helps students to want to come into a group and learn? How does the student discover that there is more to learning than the mere passing of the course?

[5] David L. Sills, "The Volunteers: Means and Ends in a National Organization," a report of the Bureau of Applied Social Research (New York: Columbia University Free Press, 1957).

In labs and in classroom situations there is some disagreement about whether activities are more relevant when initiated by members than when initiated by lab leaders or teachers. Those who hold the premise that activities must be initiated by group members or by leaders usually do not function well in a learning situation in either capacity because of their encapsulation by a need for structure. Does it really matter who initiates an activity as long as the relevance of the learning is discovered?

In the laboratory experience, each individual considered his own experience and its meaning, decided whether or not he would change, got feedback or some kind of evaluation and then decided how best to use this information. In what ways can students participate in the evaluation of their learning and in what ways can the instructor participate in the evaluation of his own teaching? How does the instructor help students to discover ways to evaluate themselves by giving them feedback on how they are doing? Could the students give the instructor feedback so that the teacher can evaluate his teaching? Could the instructor throw an idea out and let the students kick it around? Could it be possible to come up with explicit evaluation measures from which both students and instructor could profit?

In the lab experience the leader frequently checks the psychological climate. "What is going on here?" "How do you feel about what is happening?" The kind of climate that is sought is one in which there is a great deal of trust to be developed, a process which is seldom fully attained. There is a kind of psychological safeguard in the climate in which people are free to take risks. There is also an element of provocation—a kind of provocative tension which encourages involvement.

We have become more concerned about a kind of classroom situation which would be more provocative for learning. The trust element would involve risk-taking to generate ideas. Even in small classes, people won't always risk their ideas, for fear they will be rejected. We need to create a climate which includes the acceptance of ideas, not agreement necessarily, but acceptance, regardless of how far out or ignorant the ideas may appear at the moment they are presented. How do we create the kind of provocative climate where there is excitement about ideas, emotional involvement, and agitation for action?

In the laboratory process, the individual evolves his own objectives and tasks, and decides on a process. These goals and tasks cannot always be explicit to begin with in that they are part of a changing process and are made possible only if the member trusts the freedom which is his in the group—and accepts it and uses it.

How far can the instructor go in giving freedom to students to determine their own goals for learning? Can he tell students that these are the limits of the class and these are the freedoms, and then live comfortably and honestly with them? There are phony kinds of freedom which students spot immediately. Some instructors act as if they are giving freedom and attempt to hide the strings in their hands. Wouldn't it be better for the instructor to deal with the problem openly? Wouldn't it be better for him to say, "I gave too much freedom and am going to have to take some of it back" than to try a manipulating hyprocisy? At least he would be sharing his feelings honestly.

Some individuals in the laboratory run the risk of too much self-disclosure to handle at a particular time, with a resulting fear of loss of trust and respect. Some kinds of self-disclosure are exploiting, burdensome and even destructive to the development of a healthy relationship. In the laboratory we discovered that we could admit our limitations and reveal our ignorance and be respected for it. We found that honest admissions were much more readily accepted than any attempt to mask situations and indicate any type of false competence. The people who always presented an answer to every issue experienced some difficulty with the rest of the group.

In what ways can the instructor acknowledge his own ignorance, his not knowing, and use it as a learning experience? How can he honestly share the ideas which excite him even if he does not have all the answers, rather than play cat and mouse with students by acting as though he does? When students reveal levels of ignorance and lack of sophistication, is the classroom climate such that this is dealt with constructively, or is it such that the students' own sense of inadequacy and lack of self-worth is deepened?

Sometimes in a laboratory situation the leader uses the group in a manipulating way to meet his own needs. In most instances, the group eventually perceives this and calls the person's hand. This same situation can occur in the classroom. The instructor may, knowingly or unknowingly, use the class to satisfy his own needs. How can a climate of trust and freedom be built into a classroom so that, through feedback, the instructor gets information that this is happening?

Every member, including the leader, in a lab group needs to develop and maintain his own self-esteem. Sometimes in the college classroom instructors maintain or develop a false self-esteem by always appearing to be superior. Some instructors are past masters at "putting down" the obstreperous student. Sometimes such a student aims at humiliating the instructor, but there are ways to counter such attacks without destroying self-esteem.

BREAKING DOWN STEREOTYPES

The breaking down of stereotypes is one of the important outcomes of communication labs. Do certain kinds of students turn the instructor "on" or "off"? Are some instructors automatically closer to certain students because of their hair, dress, etc.? Do we give these students the benefit of the doubt at grading time? Do we patronize some students? Do we handle some with kid gloves because we are afraid to face them openly and honestly? Is it possible for us to check out stereotypes, and if we do, is our attitude likely to change?

In the lab we attempt to develop a special kind of directness. "I speak for myself" when I speak to another person. By implication this means owning my behavior and my ideas, though it does not mean that I have to keep a rigid hold on either. My behavior and my ideas are commodities, important only to the process of discovering their relation to new behavior and ideas. Although my behavior and my ideas are not necessarily a permanent part of my ego structure, they often become so. How can I hang on to the behaviors and ideas which are valid and yet to be open to the students' ideas and values? Is it possible to accept their feelings while disagreeing with their ideas?

In the "here and now" of the lab situation, members are left to determine their own direction. This can be a threatening situation in the classroom. It can also be disastrous if not handled with understanding. It is better to lay out the parameters at the beginning. There are specific knowledges and skills that are necessary. What would happen if these were outlined and identified as areas that must be achieved, with the understanding that when this is accomplished students are free to move in any number of directions. There is a built-in reward system in this kind of approach which should offer some encouragement to the venturesome.

Perhaps the most important thing we learned in the laboratory experience was that we really cared for each other. People with whom we had had only a nodding acquaintance became very close to us. In some instances, people who had been antagonistic toward each other resolved their antagonisms and became friends. With our students it may be possible to realize that the same potential for caring is as prevalent among them as it is among the faculty. Most of the barriers which exist between students and instructors may be artificial and might disappear if the instructor is open and courageous enough to really care for his students and let them know it.

I am convinced that the solutions to the problems which face us in education lie in our ability to communicate with each other as human beings. When we can communicate with each other in terms of our best "selfs," in terms of what we really want to be, solutions to our problems will begin to evolve.

W. JAMES POPHAM

A BANK OF INSTRUCTIONAL OBJECTIVES FOR THE JUNIOR COLLEGE

Any effort to increase the clarity of one's intentions should be applauded. Surely, millions of mankind's wasted hours can be attributed to unclear conceptions of objectives. Yet, when a plea for clarity regarding instructional intentions is made, resistance emerges. Whatever the reasons, there are numerous indications that advocacy of measurable instructional objectives is not shared by all educators. This is regrettable, since the basic reason that instructors are currently being urged to state their objectives in measurable terms is in order to promote increased clarity regarding their meetings.

MEASURABLE OBJECTIVES

At least three distinct dividends will accrue to instructors who specify their objectives in operational, that is, measurable, terms. Before turning to these benefits, here is the type of objective under examination.

Consider the following two goal statements: (a) The students will become familiar with the basic concepts of statistics; and (b) When presented with hypothetical descriptions of research problems, the student will be able to select (from those treated in class) the appropriate statistical-analysis technique.

Objective A is rather vague, indicating only a desire for familiarity on the part of the student. Objective B is less ambiguous, describing the kind of learner behavior to be sought, namely, the selection of particular statistical-analysis techniques. It is the latter type of objective which instructional specialists are advocating. Note that both objectives are focused on the learner rather than on the teacher's actions or the content to be covered. Since the target of instruction is the instructed, this is quite proper. Objectives such as "The teacher will conduct a discussion of the Reformation" really do not represent goal statements, only descriptions of *means* through which one wishes to achieve goals. Thus, since we are attentive to the learner, and to measurable effects of instruction on that learner, many writers refer to the objectives under consideration as *behavioral* objectives. The learner displays his attainment of an instructional objective by some type of behavior, such as when he solves problems in a chemistry examination or when he plays the cello in a recital. Teachers are now being urged to state their instructional intentions in terms of modifications in learner behavior they hope to bring about as a consequence of instruction. But what are the advantages of such behaviorally stated objectives? Let's consider three.

Improved Quality of Objectives

One of the more serious deficiencies in American schools is that too often there is an attempt to promote the attainment of unworthy goals. Unfortunately, these sometimes picayunish objectives are hidden behind a facade of profundity. Our objectives may read something like this: "The students will become better able to function as citizens in today's dynamic democracy." Few people can quarrel with the general intent of such a laudable goal. However, in the bulk of his instructional efforts the teacher may only be attempting to get students to perform well on the most trivial kinds of multiple-choice test items. By having explicit statements of our objectives, in measurable terms, we can more rationally appraise the quality of those intentions. The merits of vaguely stated objectives are simply too difficult to evaluate. Precisely stated objectives, i.e., measurable descriptions of intended learner behaviors, will invariably permit more appropriate scrutiny of the quality of those objectives.

More Relevant Instruction

One of the tremendous instructional dividends to be secured from properly stated objectives is that by knowing exactly what we wish the learner to be able to do at the end of instruction, we can more readily devise instructional sequences which are relevant to that behavior. There is a considerable amount of psychological evidence that if a learner is to acquire a given behavior, there are clear advantages in having him practice that kind of behavior during the instructional sequence. For example, returning to the second of the two statistics objectives, if we wish the student to be able to select appropriate statistical techniques for hypothetical research problems, we should give him practice in performing that behavior during instruction and prior to the final examination. There is evidence that such relevant practice will be of considerable utility in helping the learner achieve a given goal. Often instructors who have only a vague idea of what they are attempting to accomplish include all sorts of irrelevant activities. A second advantage of precisely stated objectives, therefore, is that these objectives permit the more careful inclusion and exclusion of activities during the instructional sequence.

Effective Evaluation

Very few teachers employ systematic schemes for improving the quality of their instruction. This is generally because they don't know how well they are teaching. They have few criteria to guide their evaluation of the quality of an instructional effort. They may, in error, attend to an atypical student's response regarding what he considered to be a "dull class." They may rivet on the enthusiastic participation of two or three good students, not realizing that the rest of the class is bored. However, with the explication of instructional objectives in terms of measurable learner behavior, the instructor does have a clear criterion by which to judge the adequacy of his instructional activities. If, at the end of instruction, students are able to perform the behaviors they could not perform prior to instruction, the instructor has been successful. If students are not able to achieve the measurable, stated objectives, then the instructor realizes that there are probably deficiencies in his instructional sequence. Thus, by having

precisely stated objectives, there is the possibility of improvement in time. Thus, an instructor can improve, since he has a legitimate criterion by which to judge the quality of his work.

Any of these three advantages might be sufficient to sway an educator toward measurable instructional objectives. In combination, they represent a formidable argument that instructors should be encouraged to write objectives in measurable terms.

CRITERION-REFERENCED INSTRUCTION

Perhaps the type of instructional strategy being advocated these days can best be described as objectives-oriented or *criterion-referenced instruction.*[*] This approach to instruction focuses primarily on the degree to which the learner can perform specified-criterion behaviors. For example, in preparing instructional materials, the developers decide what to revise on the basis of learner performance data, not according to the judgment of consulting experts. Or, in another situation, a school district decides to select one set of supplementary reading texts instead of another because of pupil performance on related criterion tests, not because one set of texts is more attractively illustrated than the other. Such examples accurately suggest that a primary feature of criterion-referenced instruction is a preoccupation with the results of instruction, not the procedures used to promote them. It reflects an ends-oriented approach to instruction rather than a means-oriented approach. Since most educators concur that the ultimate index of an educational program's worth is the degree to which it benefits the learner, the increased support of criterion-referenced instructional approaches is gratifying.

But against the increasingly supportive backdrop, it is distressing that very few large-scale criterion-referenced instructional operations are underway. Verbal support is there. Widespread practical implementation there is not. Why?

1. A Time-Consuming Task

The principal deterrent to expanding the extent of criterion-referenced approaches used in the nation's schools is fairly easy to identify. Developing criterion measures of sufficient quality and satisfactory breadth is too much work for most educators.

Much of the recent agitation regarding the desirability of describing instructional objectives in terms of measurable learner behavior is based on the belief that operationally stated objectives will more readily permit educators to assess the impact of instruction where it should be assessed, namely, in modified learner behavior. But many proponents of operationally stated educational objectives are beginning to complain about the paucity of such objectives in the schools. Educators can be informed of the merits of behaviorally stated objectives; they can be taught to state objectives properly; they can even become quite enthusiastic about the desirability of stating objectives behaviorally. But few of them do it. The reason is not unwillingness but, instead, a lack of wherewithal. Junior college professors are already too burdened to find the time to develop

[*] The remainder of this paper is based upon W. James Popham, "Objectives and Instruction," a symposium presentation at the Annual American Educational Research Association Meeting, Los Angeles, February 5–8, 1969.

operationally stated objectives. Most junior college districts have already committed their increasingly limited resources to other tasks.

2. Imminent Duplication

The financial and personnel costs of the isolated projects to develop instructional objectives point up another problem. In spite of the difficulties associated with the development of explicit objectives, some districts are undertaking the task. For example, several months ago the Clark County, Nevada, School District developed a set of behaviorally stated objectives for mathematics instruction, grades K through 6.

The absence of any scheme through which one district could become aware of the existence of similar developmental projects makes it probable that a distressing amount of duplication will occur among those few educators who are zealous enough to attempt the development of precise instructional aims. For instance, more than a year after the Clark County Schools had completed their preparation of K-6 instructional objectives for mathematics, two districts in different states commenced work on precisely the same project. They were unaware of the Clark County objectives.

The energy that could be saved nationally by adapting extant sets of objectives rather than starting from scratch is incalculable. For example, several of the USOE-supported regional laboratories are investing significant resources in encouraging educators to develop operationally started goals. The probable overlap between such efforts and similar projects initiated by local districts, including junior college districts, is considerable.

OBJECTIVE-GENERATORS AND OBJECTIVE-SELECTORS

It has become increasingly clear to those who have been promoting the use of operationally stated objectives that it may be expecting too much to ask already harassed teachers and administrators to generate their own objectives. Most teachers just can't find the time to do it. But though *objective-generation* may be too demanding, *objective-selection* should not be. If the instructor's task were simply to choose from comprehensive sets of operationally stated objectives those which he wished to achieve, his task would be manageable. He could follow through on his commitments to precisely explicated goals without being obliged to construct all such goals himself. But, obviously, someone needs to construct the objectives from which he can select.

Under any scheme in which the educator is the selector rather than generator of objectives there may be some concern regarding the degree to which the objectives will 'imposed from above." A viable objectives-selection scheme, however, should permit just that—the *selection* of objectives. Having selected the bulk of his goals from those prepared by others, such an objectives-generation task should be manageable. Local autonomy should be an integral part of any objectives-selection scheme.

OBJECTIVES PLUS CRITERION MEASURES

A factor which has not been perceived by all advocates of precise objectives is that such objectives may be necessary, but by themselves they are far from sufficient. Too often even a behaviorally stated objective may be used as a

window dressing for instruction as usual. A precise objective can be most helpful when planning an instructional sequence, since there is clarity regarding the intended post-instruction competencies of the learner. But an explicit objective becomes even more useful when evaluated on instructional sequence. This evaluation can be accomplished by ascertaining the degree to which the objective has been achieved. To recognize achievement we need measuring devices based explicitly on the objective.

Few school districts or junior colleges have made this logical jump from the development of objectives to the necessity of developing test items. "Test items" is used here in the broadest possible sense: for example, it includes observation of learner behaviors reflecting a host of cognitive as well as not-cognitive outcomes.) If it were possible for a school or college to have access to sets of objectives *plus test items* from which instructors could choose, the institution, after selecting certain objectives, could readily assess the degree to which its instructional approaches were successful. An instructor could evaluate his success in achieving his goals. The existence of a pool of test items for each objective would really encourage educators throughout the nation to initiate criterion-referenced instructional strategies.

THE INSTRUCTIONAL OBJECTIVES EXCHANGE

Therefore, to stimulate increasing numbers of educators to adopt criterion-referenced instructional strategies and to reduce the probable overlap in objective development efforts, the UCLA Center for the Study of Evaluation has established the Instructional Objectives Exchange, which will serve as a national depository and development agency for instructional objectives and related measurement devices. The Exchange will perform the following functions:

1. Serve as a visible clearinghouse which can be used to keep abreast of the diverse instructional objectives development projects throughout the nation.
2. Provide a bank-like agency whereby a school district (or comparable educational agency) can "draw out" all objectives and relevant measures for as many subjects, grades, topics, etc., as desired.
3. Continually update, refine, and expand the pool of objectives and measures for each field covered by the Exchange.

The potential impact of such an Exchange, readily providing pools of objectives and test items from which districts can select, should not be underestimated. With competent staffing, a careful developmental plan, and proper dissemination strategies, the Exchange could conceivably alter the nature of instructional practice in America.

Operation of the Exchange

Briefly, this is how the Exchange will function. First, through news releases, magazine articles, letters to school districts, and descriptive brochures, an attempt has been undertaken to make as many educators as possible aware of the existence of the Exchange and its services. Contained in this literature is a request that any agency which has developed behaviorally stated instructional

objectives contribute information on them to the Exchange. We are currently in the process of collecting the initial sets of these objectives, and there are encouraging indications that there may be more projects focused on the development of precise objectives than we had anticipated.

As this collection activity progresses, the staff of the Exchange will concurrently be developing objectives and related item pools. We are now refining our procedures for developing properly stated objectives and criterion-referenced items which accurately reflect the attainment of such objectives. Although our early efforts have quite naturally found us emphasizing cognitive objectives, we hope to move soon to the development of a variety of noncognitive goals. Our current developmental activities are in the fields of mathematics, language arts, and social studies. After we have developed or collected a respectable number of objectives and related items, the Exchange will make them available to the schools. A school district will identify the fields and grade levels in which it is interested and receive the entire collection of objectives suitable for those areas. The district will then select the objectives appropriate for its peculiar instructional situation and will receive a pool of measurement items for each objective selected. We hope to provide a series of categorization rubrics which will aid local school personnel in the selection of appropriate goals. Since we anticipate that the objectives-retrieval system will be computer-based, a host of interesting categorization possibilities should be available.

Since the Instructional Objectives Exchange is a project of the UCLA Center for the Study of Evaluation, we will be particularly attentive to the manner in which educators employ the Exchange system for evaluative purposes. A major project of the Center is devoted to the appraisal of this system in terms of the relationships among objectives, instruction, measurement, and evaluation.

Because of its avowed purpose to make it easier for American Educators to engage in criterion-referenced instruction, the influence of the Instructional Objectives Exchange could be considerable. Because of the empirical orientation of the Exchange staff, judgment regarding whether the objectives-exchange concept is a serviceable one will await the analysis of results in the field. Logically, the idea of permitting educators to be objective selectors rather than generators has great appeal. But logic has not always been the dominant theme in American educational practice.

A Clear Need

Due to the magnitude of the task, the UCLA Instructional Objectives Exchange is concentrating its attention on grades K through 12. We have no resources to devote to the accumulation, development, and dissemination of operationally stated objectives for the junior college level. But junior colleges are as badly in need of criterion-referenced instruction as is any other sector of American education. Perhaps as an outgrowth of this national conference a group of your leaders can explore arrangements to establish a depository of objectives particularly suited for junior college instruction. The Center for the Study of Evaluation of UCLA stands ready to aid you in this enterprise, but the initiative must be yours.

SECTION III

Plans in Action

WILLIAM SHAWL

THE DEFINITION OF SPECIFIC OBJECTIVES: A PROGRAM FOR IMPROVING INSTRUCTION

The junior college prides itself upon being a *teaching* institution rather than being research oriented. What is the teaching to which this institution is so dedicated? *Teaching* is causing learning, no more, no less. *Learning* may be characterized as *a changed capacity, for* or *tendency toward acting in particular ways.* Inferences that learning has taken place are made by observing changes in learner actions. By assessing the learner's altered responses after instruction, we can infer that learning has taken place. Teaching thus can be inferred by determining what learning has occurred; if no evidence of learning can be produced, no inference of teaching can be made. Teaching occurs only to the extent that learning takes place. This is the key question for the junior college—*did anyone learn anything?*

NEED FOR GOALS

To secure evidence that learning has taken place, definite goals and minimal standards must be established by the instructor. As the knowledgeable "expert" in his field, the instructor feels that only he can establish these criteria. He must, however, consider the nature of the institution, the purpose of his course within the total college curriculum, and the characteristics of the students. Other college personnel can be of assistance.

In brief, the rationale for the junior college instructional program is based upon the following premises:

1. Teaching is the *prime function* of the junior college.
2. Teaching is the process of *causing learning.*
3. Learning is *changed ability or tendency* to act in particular ways.
4. Both teaching and learning may be assumed to have occurred only when observable changes are demonstrated by the learner.
5. Change may be observed only if there has been a determination of students' abilities prior to instruction.
6. Specific, measurable objectives must be set so that learning may be appropriately guided.

NEED TO SPECIFY OBJECTIVES

In order to ensure learning, the instructor must structure his courses to bring about specific, demonstrable changes on the part of his students. It is not possible

to infer teaching from hypothetical expectations or sincere efforts. *One may infer teaching only if evidence of learning can be presented.* This task requires that the instructor define outcomes and specify measurable objectives for his students to reach. There are three critical questions to be dealt with when one sets out to develop an educational unit:

1. What is to be learned?
2. How will we know when the student has learned it?
3. What materials and teaching procedures will work best in helping the student learn what we wish to teach?

Not only must we answer these questions before we can instruct effectively, but the order in which they are answered is vitally important. The first question must be answered before the other two. *What is to be learned?* Specifying instructional objectives in behavioral terms is of utmost importance.

Once an instructor decides to teach his students something, several kinds of activity are essential. He must first decide upon the terminal performance specifications for the course or program. Next, he must select appropriate teaching techniques, subject-matter content, media, and methods in accordance with the principles of learning. Since one principle of learning indicates that not all students learn in the same manner or at the same rate, a variety of media may be indicated. Finally, the teacher must measure or evaluate the student's performance according to the objectives or goals originally specified.

WHAT IS AN OBJECTIVE?

An objective is an intent communicated by a statement describing a proposed change in the learner—a statement of what the learner will be like when he has successfully completed the learning experience. It is a brief description of a pattern of behavior we desire the learner to be able to demonstrate.[1] Unless clearly defined goals are established *first,* it is impossible to evaluate the course efficiently and there is no sound basis for selecting appropriate materials, content, media, or instructional method. One often hears colleagues arguing the relative merits of textbooks, films, video tapes, or computers versus the lecture, discussion, or laboratory without ever specifying just what goal the particular medium is to assist the student in achieving. *Defining the objectives specifically is essential to proper selection of teaching technique and appropriate media.* An instructor will function in a fog of his own making until he can specify just what he wants students to be able to do at the end of his instruction.[2]

Qualities of Good Objectives

What are the qualities of a meaningful objective? Basically, a well-stated objective is one that succeeds in communicating the writer's instructional intent to the reader. It is meaningful to the extent that it conveys to others a picture (of what a successful learner will be like) identical to the picture the writer has in mind. A well-stated objective is one that succeeds in communicating your intent. The best statement is one that excludes the greatest number of possible alter-

[1] Robert F. Mager, *Preparing Instructional Objectives* (Palo Alto, Calif.: Fearon, 1962), p. 3.
[2] *Ibid.*, p. 10.

natives to your goal so that you will not be misinterpreted. There are many "loaded" words that are open to a wide range of misinterpretation:

to know	to understand
to appreciate	to enjoy
to believe	

Words open to fewer interpretations are such as:

to write	to compare
to recite	to contrast
to identify	to select
to differentiate	to specify
to solve	to construct

To tell a student that we want him "to know" tells him very little. Until we tell the learner what he will be doing when demonstrating that he "knows" we have described very little at all. The objective statement must describe the terminal behavior of the learner well enough to preclude misinterpretation.

How can we best prepare objectives which will describe the desired behavior of the learner? There are a number of schemes. We have found the following steps work well:

1. Identify the terminal behavior by name, or specify something the student is to do. We are here specifying the kind of behavior which will be accepted as evidence that the learner has achieved the objective.
2. Further define the desired behavior by describing the circumstances under which the behavior will be expected to occur.
3. Specify the criteria of acceptable performance by describing how well the learner must perform to be considered acceptable. (The degree of accuracy with which he will perform this action.)[3]

Although each of these steps may help an objective to be more specific, it is not absolutely essential to include all three in each objective. The main test of whether an objective is clearly written can be determined when another competent person can select successful learners in terms of the objective so that you, the objective writer, agree with the selections.

The preparation of objectives is a developmental process as the course evolves. We must write as many statements as are needed to describe *all* our intended outcomes. Unless this is done the student is misled, there is a hidden agenda, and he must guess what is really to be learned. It is also important to develop a hierarchy of objectives: minimum objectives which all learners must successfully meet to pass the course, and more difficult objectives which stretch the best students in class. In developing this hierarchy, attention should be paid to the taxonomy of educational objectives established by Bloom and others.[4] Objectives should be established at the lower levels of the taxonomy to test knowledge and comprehension, but one should also attempt to establish some objectives at the application, analysis, and synthesis levels. A junior college course built on the defined-outcomes rationale will usually contain between thirty and one hundred specific objectives arranged sequentially within course units.

[3] *Ibid.*, p. 12.
[4] Benjamin S. Bloom, ed., *Taxonomy of Educational Objectives* (New York: David McKay, 1966).

Once a set of objectives is written for a course it is essential that it become widely known to students and to those who would evaluate the course. Students should each have a set of written objectives so that as they learn they are constantly aware of what is to be learned and what they will need to do to demonstrate that they have successfully met each objective. Knowledge of specific objectives can be of great assistance to the learner. It also makes it difficult for him to dodge responsibility for learning by using the alibi "I didn't know what you wanted."

How Objectives Relate to Evaluation of Instruction

Those who would evaluate classroom instruction also need to be aware of specific objectives. A common problem occurs when evaluation is concerned only with the instructional means which the teacher employs, without any explicit consideration of the ends. In such instances, the evaluator may rate the teacher according to the evaluator's personal standards regarding what form classroom activities should take. The teacher's goals may be at considerable variance with those of the evaluator. Thus, the evaluation should emphasize stated goals or the ends of the instructional process. There is general agreement that the ultimate criterion of teaching success should be student growth—the logical end of that process. We should, therefore, evaluate what students learn, not how teachers teach.

The instructional means may vary considerably from one teacher to another, and yet both could accomplish identical ends with equal success. We must work toward agreed-upon objectives or goals as a first step in the evaluative process.

Most teachers are not experienced at bringing about intentional behavior changes in learners. They are satisfied to cover the content of the course, maintain classroom order, expose the student to knowledge, and so on. Rarely does one find a teacher who establishes instructional objectives prior to teaching, objectives clearly stated in terms of learner behavior changes, and then sets out to achieve them. A teacher should be an efficient behavior changer. We should try to assess the success of our instructional programs in terms of behavior changes. The evaluation of faculty performance should be viewed in terms of student learnings and obtained objectives as determined jointly by faculty members and administrators. Evaluation should be a supportive process to improve instruction and to facilitate the management of college resources most effectively toward this end.

THE GOLDEN WEST PLAN

I would like to describe an instructional-evaluation plan which incorporates these ideas. The focal point of the instructional evaluation *must be the learner.* What is he expected to learn? (Objectives and Goals.) What evidence do we have that he has learned? (Validation of Outcomes; has he met the criteria?) The individual faculty member at Golden West College, in consultation with his division chairman and the dean of instruction, establishes a hierarchy of expected learnings for a specific course, and the three of them agree upon a technique for validating outcomes. This is done in a meeting of these three people at the beginning of the semester. Discussion revolves around appropriateness of

objectives and their relevance to community college students. Written objectives are to be shared with the student to assist him in the learning process. This initial conference results in an informal "contract" between the instructor and his division chairman and dean, indicating (a) what his students will learn, and (b) what system will be used in gathering evidence that students are meeting the agreed-upon objectives. The teacher, division chairman, and dean agree upon the goals they are seeking and the methods they will accept in evaluating student learning. This is more valid than "visiting" a classroom in the traditional sense of evaluating instruction. We believe that evaluation is more meaningful when together we "visit" the learning experience.

Although these discussions must begin with objectives, a good deal of the dialog concerns the use of appropriate media and teaching techniques to assist students in meeting stated objectives. When the objectives have been agreed upon, the next logical step is to determine appropriate learning strategies to help the student reach the objectives. Discussion of techniques for helping students to reach stated learning objectives *stresses what the student will do and deemphasizes what the instructor will do.* This is quite the reverse of the traditional classroom visitation, where the emphasis is upon what the teacher does.

In our system, the initial conference concludes with an agreement upon objectives to be shared with the students, and a commitment by the instructor to furnish evidence that his students are meeting these objectives. In gathering evidence of student success, it becomes immediately clear that the teacher's testing system must test whether the student has met the objectives. Instructors must know which test items test for which objectives. Students are quick to recognize irrelevant test items and to ask how they relate to agreed-upon objectives. Evidence may be gathered on other than standard examinations. There are means of measuring student gain by use of a pre-test/post-test technique. Simply giving a comprehensive test the first week of class, and the same test the last week. This does two things, it tells the instructor where the student is at the beginning of the course (thus allowing the teacher to plan better), and how much he has gained in these areas as a result of the course. Some source objectives may have already been met. Student success in meeting some objectives is measured by questionnaires seeking responses regarding out-of-class activities. Some evidence is subjective observation of student behavior by the instructor. Follow-up evidence is also collected after some time has elapsed. Each technique is used to determine whether students are meeting specific objectives.

A second meeting is scheduled in late spring with the faculty member, division chairman, and dean for the purpose of reviewing evidence. During these discussions, evidence regarding specific objectives is discussed. If the group is not satisfied with student progress on some objectives, it reexamines the objective, the test items, and the learning strategy being used. In many cases, it may be decided to alter one or the other, or perhaps all three to try to get better results. This, of course, becomes the best kind of in-service training for the instructor and more meaningful supervision for the division chairman and dean. It allows for free exchange of ideas about how to improve student performance in a setting which is conducive to the acceptance of change. The faculty member's

resources or the college's resources can be reallocated in this meeting to better assist student learning.

Precise specification of objectives is a device which can enhance communication between instructor and student, between instructor and colleagues, and most important between instructor and himself regarding purposes of a unit, a course, or a curriculum.[5] Our plan is actually supervision by the objectives of instruction rather than supervision of instructors.

In summation, we feel that learning will take place if the student and the instructor know what is to be learned. The student should not have to play "guess me" with the instructor about what is to be learned. *The best system for improving classroom instruction is one which concerns itself with the learner.* Those concerned with the instructional program, faculty and administrators alike, should therefore be willing to state specifically what a student will learn and commit themselves to provide evidence that this is the case. The purpose of a college is to help students learn. Can we judge ourselves in any other terms? Do we not have the responsibility to assess learning in specific behavioral terms?

[5] Arthur M. Cohen, *Focus on Learning: Preparing Teachers for the Two-Year College* (Los Angeles: Junior College Leadership Program, Graduate School of Erucation, University of California, Occasional Report No. 11, 1968), p. 66.

WALTER E. HUNTER

A SYSTEMS APPROACH TO TEACHING AND LEARNING

Education is confronted with many problems: both knowledge and student population are expanding, good teachers are in short supply, physical facilities are often inadequate and sometimes improperly located, costs are rising, and income is limited. One of the most perplexing problems, however, is related to the intelligent utilization of the new technology—the same technology which may solve many of the problems listed above. The problems of education will continue to produce busier teachers, higher costs, lower efficiency, greater confusion, more cheated students and a more dissatisfied community. Unless this trend is discontinued and *reversed*, the systems of education may eventually collapse from frustration and an inability to solve internal problems.

A SYSTEMS APPROACH

New solutions may be required to solve old problems. One new solution is known as the Systems Approach to Teaching and Learning. "Systems approach" simply means an orderly approach for solving problems—a structured process based on a study of all the variables related to a problem. Since the teaching-learning operation is a problem, it should lend itself to an orderly solution process. The development of a systems approach to teaching and learning consists of:

1. Defining educational objectives.
2. Developing evaluation to measure the learner's achievements.
3. Providing learning pathways for the learner.
4. Using feedback to reinforce learning of the objectives.
5. Using feedback to continuously improve the system.

A systems approach to learning and teaching is based on the careful development of a set of educational objectives. These objectives must be clearly stated in behavioral (i.e., operational) terms. In a pragmatic way, the following guidelines are helpful in writing objectives:

1. Write learning objectives in a concise manner placing emphasis on clarity.
2. Each learning objective is realistic so that students can meet it.
3. Each learning objective states what the student is able to do as well as the accuracy and conditions of performance.
4. The achievement of each learning objective can be measured.

Once such objectives are achieved, the remaining activities are primarily

evolutionary and can best be developed by teachers experienced in formulating learning strategies and evaluative materials. Each learning objective, for example, leads to an evaluative item—measurement which validates achievement. Further, each objective leads to the development of appropriate learning pathways (Figure I).

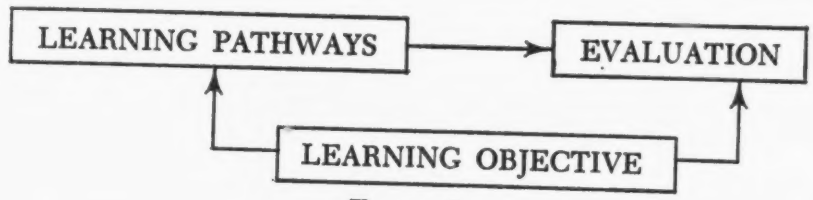

FIGURE I.

These pathways usually consist of a variety of prescribed activities which lead the student to the achievement of the stated objective. Thus, lectures, demonstrations, problems, experiments, films, programmed materials, and readings provide effective learning pathways.

When students enter a new course, teachers usually assume that all the students approximate the required entry behaviors. This situation is, of course, more or less forced, because students seldom arrive in homogeneous groups ready to be taught. The teacher's intuition may suggest that all students are not equally prepared to learn; however, his vision of his job as a teacher motivates him to move on and do the best he can. But his best usually assures that most, rather than all, students will achieve most, rather than all, of the goals of the course. To overcome this difficulty the systems concept requires that a pre-entry test be prepared, validated, and administered prior to course entry. The pre-entry test measures achievement of all behaviors assumed to be required for course entry as well as those behaviors stated as educational objectives. The results of a pre-entry may lead to one of three conclusions for each student.

1. The student possesses the entry behaviors and is prepared to enter the course.
2. The student possesses the entry behaviors and is not prepared to enter the course.
3. The student possesses the entry behaviors plus some of the behaviors included in the course.

In the first case, the student should be congratulated and welcomed to the course. In the second, the student must be directed to learning activities which will assure his achievement of the required behaviors prior to course entry. And in the third case, the student should be congratulated and given advanced placement in the course. In summary, then, learners should proceed to achieve those objectives for which they are prepared to learn.

The educational objectives as a whole describe the terminal objectives for the course. Thus, when the terminal objectives have been achieved, the learner can be congratulated and his achievement properly recorded. In the case of sequential courses, the terminal behaviors of one course serve as the required entry behaviors of the next course.

A TEACHING-LEARNING MODEL

As a basis for developing a new teaching-learning model, a new set of assumptions about human learning is proposed. Carl R. Rogers makes the following assumptions about learners:

1. Human beings have a natural potentiality for learning.
2. Significant learning takes place when the subject matter is perceived by the student as having relevance for his own purposes.
3. Much significant learning is acquired through doing.
4. Learning is facilitated when the student participates responsibly in the learning process.
5. Self-initiated learning, involving the whole person of the learner—feelings as well as intellect—is the most pervasive and lasting.
6. Creativity in learning is best facilitated when self-criticism and self-evaluation are primary, and evaluation by others is of secondary importance.
7. The most socially useful learning in the modern world is the learning of the process of learning, a continuing openness to experience, and incorporation into oneself of the process of change.[1]

When these assumptions are coupled with the concepts of a systems approach a different paradigm results (Figure II). When the initial state of the learner is

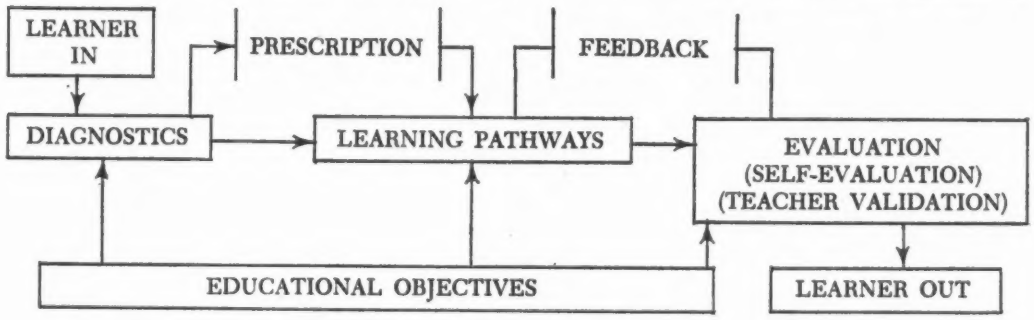

FIGURE II.

adequately described, it becomes possible to select learning tasks and pathways which maximize his natural potential for learning. Thus, the teacher becomes a sympathetic diagnostician and counselor as he helps the learner. Cooperatively the learner and the teacher decide on the learning task and pathway—the learner then initiates the appropriate activity. Evaluation is used as feedback for the learner's self-appraisal, for the validation of student achievement, and for the improvement of available learning strategies.

At first glance a system of this sort appears to be quite expensive; however, many students will require less teacher time and less intimate contact with the college. Consequently, expenses will go down. Those students requiring more teacher time and closer contact with the college will be more than compensated for by the fact that they will now be able to successfully complete the course objectives. When cost analyses are made on the basis of student-credit output and not on the basis of student-credit input, significant cost reductions may be predicted.

[1] *Instruction—Some Contemporary Viewpoints*, ed. Laurence Siegel (San Francisco: Chandler; 1967).

The projects described on the next several pages constitute a concentrated effort to develop instructional systems at Meramec Community College. These efforts are funded, in part, by the Esso Education Foundation. The Esso Project calls for the development of three instructional systems—in chemistry, in psychology, and in English. These systems are to serve as models for instructional systems which might be developed in the future at the college. But more important, the total project is designed to stir faculty interest in the components of systems design: pre- and post-testing, behavioral objectives, utilization of feedback, and nontraditional modes of instruction. It is recognized that not all faculty members are interested in using all of these components at this time; consequently, an attempt has been made to introduce techniques that may result in modest changes to make existing programs more effective. Through in-house seminars for interested faculty, the presentation of consultants, and distribution of publications on innovations, an effort has been to create a climate for innovation.

AN INSTRUCTIONAL SYSTEM IN ENGLISH

Joseph F. Dunne of Meramec Community College, a part of the St. Louis Junior College District, has made a preliminary report on a system for a course titled Developmental English. This is a one-semester program for students with writing problems that, while not critical, reduce the chances for success in the composition program. It was selected because there was more agreement on end-of-the-course behavior for it than for most other English courses: namely, the student should be able to write at a 150–250 word paragraph with appropriate thesis and supporting detail, without serious errors in grammar and usage. In substance, here is Mr. Dunne's report.

With the objective cited, it was necessary to cover three areas: improve grammar and usage skills; work to increase perception, to help students discern that they have ideas and that the evidence to support these ideas is close at hand; and develop the ability to chronicle ideas and supporting evidence so that the result effectively communicates the student's original intention. A further objective was to maintain the student's morale.

The students enrolled in this course fall *either* into the lower third of their high school class *or* into the lower quartile of the SCAT verbal. Generally the students have difficulty finding ideas for writing, often because they lack self-confidence. Also, each has problems with grammar and usage.

What are the characteristics of the system being developed? For perspective, consider Brand X, the traditional remedial course. In such a course, objectives are not defined. The only pre-testing is for placement, not for diagnosis. Reading serves as a source for ideas and models for writing. Heavy emphasis is placed upon correctness in grammar and usage, but this is often presented indiscriminately to all in the class and too often in a workbook format. The student performs, then meets with the instructor in conferences that may constitute the only individualized instruction he ever receives.

In the instructional systems approach the course expectations are stated as behavioral objectives. These tell the student what he is to do, the conditions under which he is to do it, and the accuracy or proficiency he is expected to demonstrate.

Pre-testing is primarily an effort to learn the characteristics of the student's writing. An error analysis is performed to see what trends are indicated in grammar and usage. An effort is made to identify weak habits in style and to assess the difficulty of the content. Judgments about levels of style and content are admittedly subjective, but they do help the teacher to get to know the student, his achievements and his problems, at a specific level that objective testing could not achieve.

In class, emphasis is first placed on developing awareness and increasing perception of the environment. Short films, recordings of popular music, newspaper features, and magazine selections are among the resources used. Surroundings are another resource. For example, one assignment required students to report an impression they received when they sat down somewhere on campus and observed, smelled, touched, and heard what was going on.

In developing writing skills as the course progresses, emphasis is placed upon the statement of an appropriate thesis and the selection of details and facts to support it. Essentially, then, the course centers around the paragraph with the last few weeks spent on the essay as a whole to give the students a preview of the demands of the composition program.

Everyone in class is involved. But in the study of grammar and usage, the class is narrowed to those who need to concentrate in this area. Grammar problems are broken into several distinct areas—such as sentence problems or pronoun reference. The class is given a pre-test on a particular area. Those achieving the required proficiency are then excused from class on the day or days that the subject is discussed. This procedure has resulted in a few as three people being excused from a class of twenty-eight to as many as eighteen being excused. The time-off provision serves as an incentive to the student who already knows the material and it does not penalize the student who needs help in that area.

Grammar work is reinforced by the cumulative addition of restrictions on grammatical errors in the objectives for papers. Initially, a student's papers are not judged for grammatical errors. But by the end of the semester, the student is required to write papers free of major grammatical errors.

Students have individual writing conferences at least twice during the semester. Error analysis and problems in style are discussed. Learning laboratory assignments may result.

The English Skills Learning Laboratory at Meramec is an individualized instruction center for English and reading. The laboratory is staffed by two instructional assistants, with degrees in English. They supplement the efforts of the instructor. The laboratory is primarily used by composition students. The laboratory contains programmed textbooks, teaching machines, audio tape and audio-tape/filmstrip programs dealing with matters ranging from basic grammar through sophisticated elements of style. If a student does not meet an objective, he reviews the material through conference, through special tapes in the laboratory, or by going over notes and textbook. He then retakes the test. He is not penalized for retaking the test, but he does receive extra credit for meeting the objectives the first time around.

Some early generalizations can be made about the system. Students are doing better with objectives than without them. Students also appreciate the opportunity to demonstrate proficiency. Student response has been surprisingly favorable to retesting. Several have indicated appreciation at being required to work at something until it's done well. Moreover, the fact that a test can be retaken without penalty has not decreased the number of students passing the first time the test is given.

AN INSTRUCTIONAL SYSTEM IN CHEMISTRY

A programmed, multimedia, audio-tutorial program for a college-level transfer course in General Chemistry has been developed at Meramec Community College during the past four years. One semester's work has been taught via this method with four different classes with considerable success. The second semester's work will be tested during the academic year 1969–70. Rudolph L. Heider of Meramec describes the program as follows:

The year's work is based upon behavioral objectives and permits pacing to the individual student's need.

The program differs from conventional audio-tutorial methods in that it follows the general philosophy of a programmed text. Audio information is placed on mag-

netic tapes, coded, and dialed by the student via a random access dial-retrieval system. All audio information "bits" are from 30 seconds to a maximum of 4 minutes in length. After each bit of audio the student is required to make a response. The response may consist of reading some materials, viewing a demonstration, doing experimental laboratory work, viewing film loops or film strips, or working exercises in a workbook. A workbook for each unit of chemistry, ranging from one to two weeks' work, has been written and keyed to the audio information. The chemistry laboratory, equipped with audio access, provides the facility for integrated learning of chemistry concepts and skills. Normally the student spends six to eight hours per week in this combination study-laboratory area.

Each Monday morning the class meets as a group (up to 180 students). An overview (orientation) of the week's lesson is presented with appropriate visual materials. The instructor uses this period to motivate the students by illustrating how this portion of chemistry relates to questions students have about themselves and their environment. There is no lecture during this period. When the period has been completed, the students are then free to work in the study-lab facility.

On Friday, a 25–35 minute quiz covering the behavioral objectives is given, using NCR two-part paper. After completing the quiz, the student submits the original and retains one copy of the test. Outside the lecture hall, the correct responses to the quiz are posted and the instructor is on hand to answer questions and to permit the students to grade their papers. This technique offers quick reinforcement of student response. At the end of the semester, a final examination covering the entire semester's work is given. Grading is then based solely on 90 percent or better of the total points accumulated resulting in an A, 80 percent a B, etc. No attempt is made to "grade on a curve."

During mid-week, students attend a seminar or discussion group to interact directly with the instructors in an informal manner. Groups of eight to ten students are in such seminars for 50-minute periods.

The learning pattern is open-ended. A bibliography of texts, programmed materials and visual aids is listed in each workbook. The student is advised to discover the best learning pattern for his needs. Tape and other instructional components are viewed as a means for learning, but since learning is the student's primary objective, he should have the option of choosing from which he learns best. Experience has shown the following advantages for P-AT:

1. Permits students to pace themselves and allows them to learn at their needed rate.
2. Is capable of utilizing a wide variety of teaching and self-learning techniques.
3. Maximizes personal contact between an instructor and the student to encourage, motivate and stimulate the student.
4. Emphasis is placed on self-evaluation by each student.
5. Teaches the students how to learn on their own away from a formal lecture and the classroom.

As in all things, there are certain disadvantages; these include:

1. Requires long hours of interaction with the students because of open study-lab arrangements.
2. Students must develop self-discipline to complete their work effectively and efficiently.
3. Test development—because of make-up tests and weekly quizzes—is time-consuming and demanding.

In total, students appear to prefer P-AT over conventional lecture-laboratory courses by a wide majority. The results, to date, are much improved over previous traditional instruction. During the 1968–69 academic year 65 percent of the students enrolled earned A and B grades based on achievement of stated objectives. The instructors enjoy the interaction with the students on a personal basis.

AN INSTRUCTIONAL SYSTEM IN PSYCHOLOGY

The first-year course in Psychology at Meramec Community College is student oriented, designed to provide maximum opportunities for intensive individual involvement in the learning processes. The rationale for it is essentially the same as that used for systems engineering. The course has a number of components, each of which is designed to provide the student with learning experiences which will allow him to progress to the next component in the system. The system is a closed one, with provisions for immediate feedback of performance achievement available within each component. L. Wendell Rivers describes the program:

The system is composed of four components: A lecture-discussion (LD) unit, a library (LB) unit, a laboratory (LT) unit, and an evaluative (ET) unit.

The lecture and library components comprise the input units of the system. The LD unit is designed to accommodate 150–300 students. The student receives basic information on a topic, via lecture. In addition, the student has an opportunity to clarify topic points through questions and answer sessions. The LB unit is designed to provide an extension of the information received in the preceeding unit. Here, the student is led into activities which amplify the prior information he has received. Special aids are available.

The laboratory and evaluative units comprise the output segment of the system. The main activity of the student in the LT unit is experimentation and audiovisual tutorial involvement. The ET unit is made up of selected test items which are designed to assess the degree to which the student may enter the ET unit at his discretion, at any point during the semester.

During each semester thirty-two 50-minute lecture-discussion periods are used. The topics for these periods are drawn from those usually covered in the majority of the general psychology texts presently on the market. Topics covered and their order are selected by the instructor. However, these decisions must be made prior to the beginning of the semester. No specific textbook is required for this segment of the system. The materials covered during the lectures will be represented in the content of the library unit. Here the student will find a representative sample of the current general psychology texts. His task is to choose one or more in which the content presentation is consistent with his reading level. Students receive special assistance in selecting appropriate text material.

Each student is required to purchase a laboratory manual for his involvement in the LT unit. Included in each manual is a set of sixteen laboratory exercises which are directly correlated with the content of the LD unit. Also included in the manual is an audiovisual tutorial guide.

The instructor and his laboratory assistants have in their possession a set of six test-item packets. Five of these packets contain items which relate to specific topics which are covered in the LD, LB and LT units. One packet contains items which relate to all of the topics covered during the semester. The first five packets are designated preliminary evaluative sections (ES); the sixth packet is designated the comprehensive evaluative section (CS). A student may approach the evaluative unit in two ways: (1) he may take each preliminary section as the materials therein is covered in the input units; (2) he may by-pass the preliminary sections and go directly to the comprehensive unit. The evaluative unit is open at all times during the semester; the student simply asks to enter. Students received immediate knowledge of the results of their performance in this unit.

Criterion in the ET unit is set at 80 percent. A student must answer correctly 80 percent of all of the items on the preliminary section and/or 80 percent of those on the comprehensive section. There are three possible grades: A, B, or NC percent. A, corresponds to 90 percent performance; B, corresponds to 80 percent or criterion; NC percent corresponds to a performance percentage less than criterion. For example, if a student should achieve a score of NC5, he has scored 5 percentage points below criterion and is allowed to retake that section until he has achieved criterion.

DOROTHY FERENCZ

A PROGRAMMED APPROACH TO THE TEACHING OF SHORTHAND AND TYPEWRITING

Students enter the secretarial curriculum in a community college with varied academic backgrounds. Some have not completed courses in either shorthand or typewriting, while others have completed from one to six semesters of stenographic skills and related subjects. Moreover, it is rare in any class that all students advance in speed at the same rate.

The main problem at the Harrisburg Area Community College has been to find some way to provide for these individual differences. There was concern as to the real effectiveness of the traditional method of instruction with regard to the effective utilization of professional staff. A further concern was the ever-increasing cost of instruction.

Paraprofessionals are used extensively in other fields. Why not in shorthand and typewriting? Could a paraprofessional conduct completely programmed classes? Or is it necessary to have one professional in each classroom at all times?

After a review of the literature, it was decided that audio tapes combined with transparencies and tachistoscope slides might best meet our needs. A proposal was written for a two-year pilot study to determine whether it is desirable to have a master teacher conduct more than one class in shorthand and typewriting at the same time by using instructional assistants, audio tapes, transparencies, and tachistoscope slides. The proposal was accepted for federal funding, and the two-year study was started in the fall of 1966.

A control and an experimental group were set up and matched on the basis of the ACT test scores. Materials used in the experimental and control classes were prepared at least one semester in advance, tested, and revised where necessary. The control group used the programmed approach, with a professional conducting the class, while the experimental group used exactly the same method with a paraprofessional as the instructional assistant. Detailed records were maintained of the achievement of the students for each semester; a student starting out in the control group or experimental group was assigned to that group throughout the two years. The data collected in the study indicated that there is no significant difference between the performance of students in shorthand and typewriting taught with taped instruction and dictation and professional personnel and those taught in the same manner utilizing instructional assistants.

The method of instruction developed in the study is still in operation at the College, and it is the purpose of this report to present in some detail the procedures followed.

A PROGRAMMED APPROACH TO SHORTHAND

The facilities and equipment are a very important part of the program. Proximity of faculty offices to classrooms is important, since professionals must be available at all times.

Each classroom is equipped with a four-channel audio system. The console in each room consists of four Stenorette dictating and transcribing machines connected to amplifiers, and a four-channel monitor used by the professional and paraprofessional staff to listen to the instruction. Each student desk is wired with a four-channel listening station. Each classroom is equipped with a tachistoscope, overhead projector, screen, and microfilm cabinet for storage of homework tapes.

The selection of the audio equipment was based upon the need for a system that would be easy to operate, so that students could complete out-of-class assignments without fear of damage to sensitive equipment, and to eliminate the need for additional staff to operate the system. A system was needed which would allow one complete class to be recorded on each tape, and to obtain a tape which would require as little storage space as possible. Needed also was a recorder with an index that could be easily read, and a correlated log sheet, so that any given teaching activity could be located rapidly.

The chalkboard was eliminated for presenting theory and preview. As repetitive activities, they could become a permanent part of the system when placed on tachistoscope slides and transparencies. The tachistoscope was selected for the presentation of shorthand theory and preview words, as it allowed for flexibility in the order of presentation of outlines.

All classes in the secretarial and office studies skills are taught by one full-time and one part-time member of the professional staff and three instructional assistants. The instructional assistants have associate degrees with majors in secretarial science and have gained experience in business offices prior to joining the college staff. The instructional assistants dictate shorthand tapes, following the lesson plan prepared by the professional staff; keep accurate records of student achievement; proofread and check papers in preparation for grading by the professional staff; and conduct the skills classes. Their role in the classroom is to monitor the teaching activities.

The professional staff is responsible for developing new materials for the classes, supervising the work of the instructional assistants and the students, assisting individual students, and evaluating student performance. The professional staff may be responsible for from twelve to eighteen sections per semester.

Because a programmed approach to instruction requires thorough planning of the objectives and the teaching activities, a detailed lesson plan was prepared for each day's class, setting forth the objectives, the order of teaching activities, the specific activities, and the amount of time to be devoted to each activity.

Four tapes are available at different speeds for each class period, thereby providing for the use of new technology in the traditional classroom and at the

(2)

same time permitting each student to progress at his or her own rate of speed. The tapes were prepared by the staff, in order to present all classroom activities on each tape. This allows students to repeat a lesson or to make up classes when absent. Silent time is allowed for on the tape. In addition, preview and postview time is programmed.

All four semesters of shorthand are taught with audio tape, tachistoscope slides, and transparencies. Each lesson plan is filed in a separate folder in the office. The instructional assistant, from the first page of the plan, determines the materials that will be needed for the class, as well as the time at which the professional staff must be in the classroom the next day. Although the professional staff visits the class at other times to observe and assist, the time when they must be in the classroom is recorded on a log in the office to insure that someone will be present at the specified time. All of the materials are placed in a special portfolio; the next day, the instructional assistant needs only to pick up the proper portfolio, enter the classroom, load the tapes on the console, and prepare her other visual equipment for operation. When the class begins, she simply turns on the machines.

Four tapes, each at a different speed, are available for out-of-class work by students. These are housed in microfilm cabinets in the two classrooms and the students are required to use them at their convenience. Preview and postview time have been provided on the homework tapes, to insure, insofar as possible, that the students will use the proper techniques in preparing out-of-class assignments.

When the original materials were prepared, the teacher presented all new theory in Shorthand I. This material has now been placed on audio tapes. Throughout the preparation of the material and the pilot program, the professional staff was concerned with the attitude of the students toward the method of instruction. Leslie[1] points out that failure to learn shorthand may be caused by the students' lack of cooperation in the learning process. Therefore, it would seem that if the student does not approve of the method of instruction, learning can be deterred. Informal discussions with students by the instructional assistants and the teachers indicated that the instruction was being favorably received. However, the students were asked to complete a survey form at several stages in the program, though not required to identify themselves. The summaries of these surveys indicated that over 90 percent of the students favored the method of instruction, and the following are some of the advantages as set forth by the students:

1. Enables everyone to work at his own speed without holding the rest of the class to a certain rate of speed.
2. Every explanation is planned. There is no time when your mind can wander because of pauses in the explanation.
3. You could practice anytime you wanted to.
4. It helps you think for yourself and it is a pleasant change from high school.
5. Technicians can help each individual more thoroughly.

[1] Louis A. Leslie, *Methods of Teaching Gregg Shorthand* (New York: Gregg Publishing Division, McGraw-Hill, 1953), p. 287.

There was some concern throughout the study as to whether the individual faculty member would lose his identity with the students, and whether the personal contact with students would become theoretical rather than real. An evaluation of the master teacher at the end of the two years showed, however, that there was no significant difference in the student's evaluation of the all-round teaching ability of the faculty member.

A PROGRAMMED APPROACH TO TYPEWRITING

The preparation of the material for a typewriting class proved to be more difficult than that for shorthand classes. Many more illustrations were required, and a meticulously prepared script was necessary to insure that all instructions were clear and accurate and that the point at which the illustrations (consisting of some commercial and some homemade transparencies) were to be shown was clearly indicated. The audio tapes were prepared by the professional staff. Each contains a full class period, and silent time is allotted on the tape to permit the students to perform tasks when assigned. No live teacher instructions are given in the classes. Constant supervision and assistance are provided by the instructional assistants and the professional staff.

Students may bypass certain activities when it is found that they do not need instruction in that area. For example, pretesting of students indicates in some cases that the students know the alphabetic keyboard fairly well; however, they have not learned to type the numbers in the proper way. At the same time, they show on a test that they are familiar with the procedures for setting up simple tabulations and typing short personal business letters and manuscripts, which would ordinarily be taught in Typewriting I. These students are enrolled in Typewriting I and begin immediately on the numbers. When they have completed the numbers, it is then possible for them to move on to the learning activities presented in Typewriting II.

Students with a background of typewriting in high school are given an exemption test for Typewriting I. If they pass, they are placed in Typewriting II. Even with this program, it is found that some students are rather far advanced for Typewriting II. As soon as this is determined, these students are given some additional experiences, though certain lessons are a must for all students. The specific tapes for these learning activities are taken out of sequence and presented to these students. The students are then given instruction on the magnetic-tape selectric typewriter. They learn to program material on this typewriter and, where possible, are given real projects to do, so that they may become as proficient on the machine as possible. In this way, an additional effort is made to provide for individual differences.

Students are as enthusiastic about the programmed approach in typewriting as they are about that in shorthand. The surveys of student attitude indicate that the students find similar advantages: ability to move at their own rate; the classes are well organized, so that very little time is lost; and the instructions are clear and easy to understand.

ADVANTAGES TO THE PROGRAMMED APPROACH

The faculty is enthusiastic about the program because it is flexible. In addition to freeing the faculty member for the preparation of materials to be used

in the classes, the program actually brings them in closer contact with more students on an individual basis than was possible with the traditional approach. It also facilitates the scheduling of small sections which would normally be exorbitant in cost. Two and even three small sections may be in operation in one classroom.

It is possible to give a student a special class; for instance, she might be scheduled for Typewriting IV and be in the same room with a Typewriting II class for various reasons. Furthermore, if a student is absent for a long period of time because of illness, it is possible to send a machine and copies of the tapes home to her so that she can keep up with her skills classes, thereby eliminating the need to drop out.

The professional staff took a hard look at the teaching acitivities that had been used, and in many instances challenged the effectiveness of what had been considered worthwhile activities. The staff began to question the organization of some of the material in the textbooks, asking whether too much was given in the way of instructions and information, thereby eliminating the need for students to make decisions. The faculty is making an effort to improve the instruction in some areas by developing their own material.

Although the programmed approach to the teaching of shorthand and typewriting has been successful in providing for individual differences, it is utilizing professional time more effectively, and, in reducing costs, it has not become static. Revisions are constantly being made, and, as new technology is developed, more and more changes will probably take place.

NEW HORIZONS

The use of new technology can help to accomplish better a traditional type of program of instruction and could lead into what might be considered true innovation. If we are to prepare students for initial employment in the job market at several steps above the entry level, and provide them with the background necessary for rapid promotion to the executive-secretarial level, then we must be bold enough to provide the students with better opportunities to develop decision-making ability while still in school. Allow me to present a very brief outline of what could become the advanced secretarial classroom of the future.

The secretarial career program is an integral part of almost every community college in the country, and the paper work generated within the offices of these colleges becomes heavier and heavier. The usual solution is to hire more employees, although our own students could be given this opportunity to participate in *real* learning activities. It might be possible to move away from the traditional classroom setting for the second year of the secretarial program and combine the shorthand, typewriting, office procedures, office management, filing, and business machines courses into one course, which might be called Office Procedures and Administration. Lectures on specific topics in office management, office procedures, and filing could be prepared on audio tapes and other media, placed in the library, and assigned as homework—or such material could even be incorporated into the class hours. The students could then be given the opportunity to follow the theory presentation with actual practice in the

secretarial processing center. For example, in office management, students study forms analysis and design. What a terrific learning experience to allow the students to study and design the forms necessary for the smooth operation of a real office and then see them actually being used! They would then have the opportunity to review their mistakes and revise their designs.

In office procedures, a unit on the telephone is usually always taught. The students could certainly be given the opportunity to use the telephone in a secretarial processing center. Video-tape equipment could be used to record the scene when the student is receiving and placing calls. It could then be reviewed immediately by the student and instructor to discuss the correct procedures being used as well as the areas in which improvement could take place.

Most work in the traditional classroom makes its way to the wastebasket within a short time after completion. In a secretarial processing center, the work would not be thrown out. Of course, it would be necessary to insure that such a center would be a true learning situation. This could be accomplished by employing full-time office technicians who would be responsible for maintaining a steady flow of work even though the students would be able to complete much of it. Such a class might even replace the traditional cooperative work experience program. It might even be possible to work out a system whereby the students would be paid.

Could such a program become a reality? It would require extensive use of new technology and meticulous planning. If properly planned and organized, such a course could certainly provide a more meaningful learning program for the students.

As a direct outgrowth of the programmed approach to the teaching of shorthand and typewriting, a small office has been set up at the Harrisburg Area Community College. It has central recorders, secretarial stations, telephones, and magnetic-tape selectric typewriters. The students work in the office for one half of each semester of the shorthand and typewriting classes. It has proven to be quite successful in allowing the students to put the theory learned into practice and to receive actual office experience before entering the cooperative work experience program, even though the total number of hours a student may spend in this office are somewhat limited. In this small office, the students transcribe correspondence for the faculty from voice-recording equipment, answer the telephone, compose letters, maintain reminder systems, schedule appointments, and set up and maintain files and desk manuals.

Perhaps, some day, secretarial education will progress to the more elaborate program outlined earlier in this report.

THELMA ALTSCHULER

ENTERTAINMENT FILMS AS AN INNOVATION IN JUNIOR COLLEGE TEACHING

Good, professionally prepared films can be usefully adapted to several different disciplines within whatever your definition of Humanities may be. I would like to see film used for its own sake (in the case of good art), as the basis for locating the forces which have already influenced us, as illustration for dramatic technique, for self-awareness as reactions clash with others.

At Miami-Dade Junior College, film is used in this manner.* It is used in a required Humanities-Drama course which had previously been play *reading* but which became a course in drama (including film) with the emphasis on *viewing*. (Fuller descriptions are available in Thelma Altschuler, *Responses to Drama* Houghton Mifflin, 1967, the text for the course, and in Thelma Altschuler, "Using Popular Media to Achieve Traditional Goals," *The Journal of the Conference on College Composition and Communication*, December 1968). The course includes, for example, a full-length comedy film as a means of *showing* the pleasure of comedy. In teaching a tragedy we also have an example in the form of a film. Differences in manner of presentation are pointed out—a modern classroom as opposed to a Greek amphitheater. Use of film makes one aware of media. Faculty morale is taken into consideration in that each teacher emphasizes what seems important to him. I encourage critical awareness through the use of the mini-review, a four-page report with as little as one line on each page, so long as the distinction is recognized between "personal," "literary," "craft," and "sociological" approaches. Writing should be unpretentious and straightforward. The student should trust that his reaction is wanted, aided by practical aesthetics but without meaningless jargon.

In the Humanities Cinema Appreciation course (an elective), full-length features are shown, beginning with simple action films and proceeding through comedy, "misunderstood-youth," and unclassifiable complex films featuring the talents of a director.

In using film it is still possible to put into practice the use of instructional objectives. At its simplest, this may be only "Student will voluntarily appear to see the films." Most of us would not be satisfied with that objective. But we can demand more challenging demonstrations of ability, such as "Participate" through panel discussions, individual presentations, debates; "Define or recog-

* Several films which Mrs. Altschuler uses in her teaching were viewed at the Conference.

nize critical terms"; "Apply critical terms," by bringing in examples observed outside of class, in films or television; "Identify bias of various reviewers for magazines of diverse interests"; "Differentiate between the personal and other approaches to film."

I hope that you will encourage the use of film in your schools. The popularity of film has been demonstrated in many ways, including the students' own interest in film making (we lend students cameras at Miami-Dade); the introduction of film courses in experimental colleges with curriculum designed by the students themselves; and the good attendance we had at a recent Film Workshop sponsored by Miami-Dade and attended by professors from different disciplines and from various parts of the country. We will soon be offering a course in the use of film in teaching high school English. The movement seems to be growing. When some member of your faculty expresses the desire to use film in a new course, let him. Better yet, encourage the use of film in courses which already exist. Film allows teaching of what you think is important without the material "getting in the way."

BENSON R. SCHULMAN

TEACHING THE HIGH-ABILITY, LOW-ACHIEVING STUDENT IN ENGLISH: INDIVIDUALIZED INSTRUCTION IN ACTION*

Every educator ought to be an experimenter, a searcher for knowledge and an innovator in instructional methods, particularly now—in an age of social turmoil, in a time of technological change, in a period of population growth, in a psychological climate of isolation. So expanded have our schools become in size, so varied are the pressures placed upon them, so discomforting are the confusing alternatives from which to make decisions, that educators often do not know what to consider first. Perhaps the greatest problem we face today is sheer numbers—of *people*. We are so attuned to quantity as a primary consideration, that we often, and inadvertently, overlook quality. We are so taken with groups that we overlook the individual. We are so surrounded by myriads, that each of us, in order to survive, consciously or subconsciously seeks isolation.

What *is* this isolation? Is it a wholesome preservation of individuality? Is it escape? Is it a vacuum created by poor or no communication? Is it the cold remaining when human warmth and concern are absent? Is it the failure of outstretched hands to touch? Is it the result of ideas which pass each other, failing to interact? Is it ignorance—of parent and child, of group and group, of scientist and humanist, of—educator and student?

I am here to report on "Teaching the High-Ability, Low-Achieving Student: Individualized Instruction in Action," but I cannot do so without considering my most important finding—that, for years, I did not know my students. We were isolated from each other. I might never have realized this were it not that in December 1967 I was offered an opportunity to experiment with instruction in freshman composition. The plan was to investigate whether individualized instruction would appeal to students whose records in high school showed them to be high in ability and low in achievement. To control the experiment, we would combine these underachievers in the same class with students who enrolled in random fashion. Selection of the experimental group, the underachievers, was made on the basis of certain criteria; I had no part in that process.

My own first task was to familiarize myself with the proposed method of

* The project reported here was sponsored by the UCLA Danforth-Junior College Program, of which M. Stephen Sheldon is director. It was partially funded by the Westinghouse Learning Corporation.

individualized instruction, contingency contracting, a system which emphasizes increasing motivation among students by transforming the instructor-student relationship into a cooperative rather than authoritarian one. It stresses the individuality of the student as much as does the course of instruction.

When a course based upon positive contingencies is introduced, the student is informed, *before* he undertakes any work, what he is expected to learn and to do (objectives), how the instructor proposes to help him (methods), and how his performances and learning are evaluated as to quality (criteria). Furthermore, the student learns that he and the instructor will share responsibility for selection of his required work—and that such selections will be based upon his needs.

Initially, the instructor conducts diagnostic testing (pretests) to determine what the students knows and what he can do; thus, inductively, the student learns about the gaps in his knowledge and the weaknesses in his performance. It is at the time of student awareness that the instructor contracts with him to help him learn. The instructor fulfills his part of the contract by providing the student with individualized help; the student fulfills his part by performing the assignments. This approach encourages the student to behave purposefully, because he can understand precisely why he is asked to perform his tasks.

I told each student that I valued his presence in the class and that my purpose was to keep him there so that he could succeed, and that despite the existence of general course objectives, he would perform within a framework of his own weaknesses and strengths. After testing him, I would ask him to perform assignments prescribed specifically for him. I would not assign him low grades on poor initial performances (negative contingencies); instead, I would delay grading until he had had a chance to learn. I advised him that the semester as a boundary of course length did not necessarily apply. Instead, he could work at a rate compatible with his own abilities and initiative.

Each student was provided with a handbook which described all of the course units and which clearly stipulated objectives, criteria and prescriptions for each unit. He was informed that regular class attendance was a function of need: he would attend as much as, but no more than, necessary because the instructor hoped he would grow in self-management ability. The student was advised of the plan to limit large-group sessions to a minimum and to place great emphasis upon the instructor-student conference.

One of the early experimental classes was conducted at Pierce College. There was a group of eighty students of which forty-four were specially selected underachievers directly from high school. The remaining thirty-six were people who had either scored well in the English Placement examination or who had completed one or more remedial classes before enrolling.

Sixty-seven completed the class at or before the semester's end. Among these, 8.90 percent earned "A"; 19.40 percent, "B"; 54.17 percent, "C"; 5.97 percent, "D"; and 1.49 percent, "F." Of the remaining thirteen students, ten did not complete the program and three finished late.

These data deserve explanation. First, not one student "dropped out" of the class who did not also drop out of school completely! Second, the three students who completed late had personality problems and clearly would not have finished at all in a conventionally organized class. Furthermore, two of these

students have, in my judgment, been materially and perhaps permanently influenced in a positive manner. Third, I managed to learn *why* my students performed as they did. Not one, I am pleased to say, had negative reactions to the conduct of the class.

Student performance during the spring 1969 semester compared favorably with results of the previous semester. The grade "A" was earned by 13.9 percent; "B" by 25.3 percent; "C" by 50.7 percent; "D" by 1.2 percent; and "F" by 8.5 percent. Six students withdrew from the class and from school, thereby receiving the grade of "W," and four students are presently incomplete but should finish soon.*

The spring 1969 results deserve some explanation. Of the 8.5 percent "F" students, only one actually completed the work of the class and earned an "F" performance; the others withdrew from school unofficially, but I held them to the final grade requirement because I could discover no legitimate reason for doing otherwise. Finally, the underachievers, as a group, did not do as well as did the other students.

My tentative earlier conclusion about the experimental class not producing differences in appeal to the underachievers on the basis of their ability alone, appears to fit the control group too. In neither group does level of ability correlate with final grade.

Was the experimental design valid? Its purpose was to enable comparison of specially selected underachievers of high ability directly from high school, with a control group enrolling randomly in the same college freshman composition class. The answer appears to be that, although the design appeared reasonable, no effective comparison was made, because the two groups were not dissimilar enough. For example, seventeen of the underachievers were in the I.Q. range of 116–120. The standard deviation of the normal curve being 10 I.Q. points, it is questionable, therefore, as to how many of them may be labeled underachievers of high ability as opposed to normal. Furthermore, it was not possible to control the random class enrollments; therefore, the distribution of ability among the controls ranged from 90–138 I.Q. How different is this from the underachievers' range of 116–147 I.Q.? Finally, how effective is the "contrast" when we learn that the modal range for each group is the same, 111–120 I.Q.?

I think we must ascertain the meaning of the term "underachiever." Presumably, it means simply, "a person who is not performing as well as one might predict from his ability as recorded on an objective test." It cannot mean "gifted" in this study, because only three underachievers had I.Q.'s above 130, the commonly accepted point above which the gifted are distinguished from the normal. Furthermore, four of the controls, to confuse the matter further, scored above 130 in I.Q., and of these four, one earned an "F" and another is still working. Cannot these two controls, potentially gifted, be called underachievers? Cannot two additional controls with I.Q.'s of 126 and 128, who earned only "C," be termed underachievers too?

From all of these data, I conclude that the groups in the experimental class were more similar than dissimilar, and that, in effect, we have not been studying

* Since the date of first writing, three students completed the class successfully; one was dropped at the recommendation of his psychiatrist.

the effects of an experimental system upon a high-ability, low-achieving group as opposed to a group with normal abilities. What we have been studying is the effects of a *system* of instruction upon junior college students among whom some differences might randomly exist.

To effect a further comparison, I contrasted the final grades of students whom I and my colleagues had taught by conventional methods with those earned by students enrolled in the individualized classes. Clearly, student performance in the individualized system was superior. Something had been happening as a result of individualization that had led to higher performance than occurs in conventionally conducted classes. Furthermore, this difference, whatever it is, cannot be attributed to ability factors, as has already been demonstrated.

What is the denouement of my story? The most important finding is that student performance in the experimental classes, taught by an individualized method, was good. Furthermore, I believe that this finding is the quintessence of the matter, for anything less than good student performance is tragically wasteful. If my data are valid and reliable, then factors other than ability alone are critical determiners of success in junior college.

What are junior college students like? A year ago, when working on introductory material to the course of study for this experimental freshman composition program, I examined this question carefully. I found that many junior college students underachieve, whether they are normal or superior in ability. They demonstrate apathy and/or antagonism toward education. The apathy is revealed by a high degree of unresponsiveness, a feeling of "Does it matter whether I succeed or not?" Apparently they have not derived much pleasure from the educational experience, they lack any certain level of aspiration, and they have learned to live with their tendency "to cop out." Many of them show a feeling of antagonism because they believe that educators do not care about them as individuals. They resent the molds into which all students are "poured" without reference to their personal or educational needs.

The results of these attitudes are tragic, for one of the most perplexing problems facing junior college educators is the waste of human and financial resources. The rate of dropout in freshman composition classes is far too high. This problem exists despite the offering of several levels of remedial classes within many schools. For example, 80 to 90 percent of the students are required through placement tests to complete one or more remedial classes in some schools, before taking college-level work! In the face of so much remediation, efficient instruction is needed. Presumably, if students can be persuaded that the college is concerned with their retention and success, not with just giving them the opportunity to fail, they may put forth greater efforts than they do under a more impersonal system.

College administrators are often too much taken by the question of how *many* students can be enrolled in a class—as opposed to how many *ought* to be enrolled in this subject or that. The emphasis is too often upon *how many students* an instructor is teaching rather than *how well* he is teaching them. The instructor, too, is overly concerned with how many assignments he can give and still manage the work of his class. His classroom is filled to bursting. He feels oppressed, and, thus, he isolates himself from his students by his excessive objectivity. He

fails to focus upon the individual. As often as not, he never knows his students at all, except as test or paper writers.

What are the solutions to these problems? How can our gigantic educational enterprise account for all the individual variations which exist among students? There is only one answer that I can supply: Administrator, Counselor, Teacher, *know thy student.*

How can educators today, in these disordered times, afford not to place some value upon human variations? We are not able to train "alphas" or "betas" or "gammas" a la Huxley, nor would we want to do so. We are not able to "ring the bells," as did Pavlov, in order to stimulate some sort of standardized mental salivation.

We are, or ought to be, in the business of raising the quality of human existence, of encouraging attitudes of inquiry, of stimulating self-motivated behavior. We cannot hope to do so until we persuade our students that we are concerned with their human needs. We cannot hope to do so until we know our students!

I have said a great deal about how I feel about individualized instruction, but how did the students feel? In a final questionnaire given to all students who completed the course, they supplied the answers. They indicated growth in such characteristics as valuing learning for its own sake, self-management ability and wanting to work; and they expressed appreciation for instructor concern, individualized help, freedom from pressure, and treatment as mature individuals. Furthermore, no substantial changes in course organization were recommended by a majority of the students, but a few said that they would have liked more conferences than they thought the instructor was able to have.

Although I have no ultimate answers to offer doubters, I do have some convictions. I believe that it is difficult for the instructor who teaches only "groups," to know how many individual students are really learning—until, often, it is too late to effect significant changes. With an individualized approach, however, an instructor learns about his students' problems quite rapidly and he is able to prescribe remedies efficiently. He has greater opportunity to persuade each person that his assigned work has value and he is able to observe each person's progress quite closely, and as often as necessary. He also has the opportunity to uncover personal problems which a little understanding and warmth can sometimes do much to rectify. I like the changes which I have seen take place in my students and in me because, together, we have managed to destroy some of the isolation which threatens us.

The future of individualized instruction is important!

SECTION IV

Toward Improvement

BERNARD J. LUSKIN

COMPUTER-ASSISTED INSTRUCTION: A DREAM AND A REALITY

Carl Rogers notes that "Changingness" must become a central element and aim of American education." Changingness, i.e., a process that is continuing, fluid, and adaptive—a continuous constructive turmoil.[1]

Change, it appears, is the only constant on which we can count. In the context of educational change, technology promises to have major impact on educational materials, the organization of the school, the learning environment, and the structure and availability of knowledge.

The use of computers in instruction, as one component of technology, promises to add valuable dimensions to education. Computer-assisted instruction is a new area, and, from a pedagogical point of view it has vast potential in the application of instructional techniques.

In reading a report of the President's Science Advisory Committee, we find the following statement:

> No matter what his specialty, the student must be given the opportunity of using computers in learning and in doing, and the faculty member must be able to use computers in teaching.[2]

Daniel G. Aldrich, Jr., Chancellor, University of California, Irvine, stated:

> While the problems of cost is formidable, our (UCI) experience has served to renew our conviction that the computer promises to be a highly useful tool in education; a tool which could provide great enrichment to college teaching; a tool which could open new worlds of learning to more and more young people—perhaps on a scale as vast as the printed book itself.[3]

Dr. James A. Turman, Associate United States Commissioner of Education, at the International Convention of the Association for Educational Data Systems in May 1968, said:

> Computer Assisted Instruction is an improvement over programmed instruction. It provides the capability for the first time of completely individualizing instruction for learners without having to depend on the physical presence of a human instructor. In addition, it removes from the instructional setting the real uncertainties in any real-time interaction between instructor and student. It keeps exact records on instruction at any time the student can have access to the terminal—a condition of some significance for technology. Yet, it will never replace the instructor.

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[1] Carl R. Rogers, "A Practical Plan for Educational Revolution," *Educational Change, the Reality and the Promise* (New York: Citation Press, 1963), p. 117.

[2] *Computers in Higher Education*, Report of the President's Science Advisory Committee (Washington, D.C.: The White House, February 1967), p. 2.

[3] Daniel G. Aldrich, Jr., in *Chancellor's Log* (Office of the Chancellor, University of California, Irvine), VI, No. 2 (Spring 1968), 1.

> The power of Computer Assisted Instruction depends, not so much on the technical characteristics of the hardware, as on the solidity of the course materials. When I say, then, that CAI will not replace the instructor, what I really mean is that it will change his role and make it much more powerful.[4]

This recognizes that new educational technologies will require considerable understanding on the part of educators. The horizons of what can be accomplished through appropriate coupling of learning theory and technology have disappeared. The human factor will make the computer a useful tool in learning and an instrument for change.

PERSPECTIVE: A LOOK BACK

Teaching Machines

> Despite a great variation in complexity and special features, all of the devices that are currently called "Teaching Machines" represent some form of variation on what can be called the tutorial or Socratic method of teaching.[5]

The Socratic method of instruction guides students along a path of knowledge by taking them from fact to fact and insight to insight. The first device applying the teaching-machine principle was developed in the 1920's by Professor Sidney L. Pressey of Ohio State University.[6] It consisted of a series of questions and multiple-choice answers mounted on a revolving drum. Each frame was viewed through a window in a shield covering the drum. On the right side of the device were four keys that the student pressed to select an answer to the question appearing in the window. When the student pressed the wrong key, however, the drum would not move. Thus, the student could work his way through the entire series of questions only by answering each question correctly.[7]

During the 1930's and 1940's, the teaching machine was neglected and the impetus to encourage and exploit it was lost. The 1950's brought increased research activity by social scientists, which led to greater knowledge of human behavior and the learning process. This research activity stimulated educators to look for new approaches to instruction. The conditions of the world had changed during this period and so had many of the derogatory attitudes about teaching machines. Interest in their use was renewed.

Computers

Although there were early attempts to develop devices that could be conceptually categorized in terms of what we now call computers, the first practical development of the computer occurred about the same time as atomic energy.[8] The first stored-program computer to operate successfully was the Mark I, built at Harvard University during the years 1939–1944. It was orginally designed to perform complex computations required to prepare mathematical tables necessary for properly firing artillery projectiles. The first computers were largely one of a kind and were designed for specific purposes. The introduction

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[4] James A. Turman, "Computers—The Humanizing Factor in Education," *AEDS Monitor* (Association for Educational Data Systems), VI, No. 10 (May 1968), 3.
[5] A. A. Lumsdaine and Robert Glaser, *Teaching Machines and Programmed Learning* (Washington, D.C.: National Education Association, 1962), p. 5.
[6] Sam and Beryl Epstein, *The First Book of Teaching Machines* (New York: Franklin Watts, 1961), p. 35.
[7] *Ibid.*, pp. 19–20.
[8] Enteiek, Inc., *CAI Guide* (June 1968).

of commercial models occurred in the decade 1950–1960. By 1965, there were about twenty-five thousand commercial computer systems in use in the United States.[9]

The report of the President's Science Advisory Committee, *Computers in Higher Education,* projects sixty thousand computer systems installed by 1975.[10]

Computer-Assisted Instruction

Zinn notes that instructional uses of computers have been under investigation for the last ten years, with rapid change occurring each year. Three projects begun around 1958 are examples of early experiments with CAI: (1) A demonstration of computer teaching of binary arithmetic at IBM's Thomas J. Watson Research Center, Yorktown Heights, N.W.;[11] (2) System Development Corporation about the same time used the computer as a control unit for a random-access, projection device to provide a flexible teaching machine for research on branching modes of programmed instruction; and (3) J. C. R. Licklider and John Swets at Bolt Beranek and Newman were looking at a variety of uses, including construction of graphs in response to requests made by students in analytic geometry.[12]

Zinn further notes that the number of projects identifiable in 1961 was about eleven.[13] The number of distinguishable projects and samples of instructional materials doubled by 1963 and by 1965 had doubled again.[14] Entelek now documents over 310 programs that are available throughout the United States.[15]

A survey of the more than ninety junior colleges in California, which I conducted in the fall of 1968, found fourteen indicating some type of CAI development on campus and another nine which had conducted formal planning sessions to look at the possibilities of becoming involved in CAI. Follow-up letters to these institutions revealed high interest but showed that the actual development existing was less than the number implies. There is, however, some development.

Napa College, for example, indicated that it has been connected to Stanford's IBM 360 system since April 1969. Napa indicated a professor of English working on the teaching of spelling, a graphic arts professor working on a unit in that field, and philosophy students using terminals in philosophy to study logic. A counselor is also working on a program to interpret, in dialogue form, from the results of aptitude tests and student answers regarding goals.

Dean Morosi of Pierce College noted extensive use in the mathematics area for problem solving. He also indicated that Pierce has recently started an in-service training program for faculty in cooperation with the education section of IBM to increase faculty understanding of data-processing systems.

Frank Yett at Pasadena City College indicated the development of CAI

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[9] Joseph H. Kanner, "CAI—The New Demonology?" *Datamation* (Greenwich, Conn.: F. D. Thompson Publications, September 1968), p. 38.
[10] *Computers in Higher Education, op. cit.*, p. 59.
[11] Karl L. Zinn, "Instructional Uses of Interactive Computer Systems," *Datamation* (Greenwich, Conn.: F. D. Thompson Publications, September 1968), p. 22.
[12] *Ibid.*, p. 23.
[13] *Ibid.*
[14] *Ibid.*
[15] Robert M. Gordon, "Computer Assisted Instruction: Some Operational Aspects," *Datamation* (Greenwich, Conn.: F. D. Thompson Publications, January 1969), p. 39.

lesson materials to teach FORTRAN (a compiler programming language). Dr. B. Lamar Johnson, while visiting Chicago City College, found a notable interest in CAI and identified several faculty members working in the area. Chicago City College is working on a cooperative project in CAI with several other institutions, under the leadership of Illinois Institute of Technology.

The College of DuPage in Illinois has remote terminals installed in several local high schools performing basic counseling services.

At Orange Coast College, faculty members in the trade and technical division, business division, and mathematics and science division are working on CAI program segments. One instructor is now using random-generated questions for make-up tests, and a terminal will be installed in the campus "Windjammer" store so that students operating the store can do so using modern technology. Portable terminals have been installed in several divisions around the campus.

At Golden West College, several instructors are working on course segments in English, business, and mathematics. A project supported by the Law Enforcement Assistance Administration is operating in the Golden West College Police Science Program. The project is a cooperative effort between the college and the Los Angeles Police Academy in the teaching of criminal investigation. A project in biology has been approved by the National Science Foundation in which Golden West College and the University of California, Irvine, will conduct institutes in the summers of 1970 and 1971 for the preparation of materials using media, including the computer, in the teaching of biology.

WHAT IS COMPUTER-ASSISTED INSTRUCTION?

Gordon notes that:

> CAI is in the position of Gertrude Stein's "rose" (a rose is a rose) or the Shakespearean cliché (a rose by any other name would smell as sweet).[16]

What Gordon meant was that computer-assisted instruction may be called computer-based instruction (CBI), computer-assisted learning (CAL), computer-managed instruction (CMI), computer-aided teaching (CAT), or some other acronym.

Possibly, terminology makes no difference. But some attention should be given to clarifying terminology. Gordon suggested that since the terms had already passed into the language, it would be difficult to do anything about them even if one wanted to. "Computer-assisted instruction" (CAI) seems to be the generic term which applies in general to the "use of the computer to facilitate learning."

Alternative strategies, however, may be used to discuss, plan, or implement CAI. Within the framework of facilitating learning, there is a taxonomic hierarchy which lends itself to CAI. Suppose now we try to establish an ordered taxonomy of the use of the computer in learning. The discrete terminology is arguable, but the separation of areas within CAI seems clear.

Taxonomy of Computer-Assisted Instruction: Approach Strategies

1. *CAL—Terminal interface designed to facilitate learning:* Computer-assisted learning is the most experimental, most criticized area in which the fewest

[16] *Ibid.*

materials have been developed. CAL involves behavioral change stemming from the direct interface of a student with a computer terminal. The "terminal as a tutor" helps to point up the meaning. Stimulation, gaming, problem solving, programmed text-type materials, or drill and practice may fall into this category. When the computer terminal and the student interact on a one-to-one basis without other assistance, we observe a unique type of activity requiring sophisticated design and programming to be effective.

2. *CMI—Management of a process designed to facilitate learning:* Computer-managed instruction might be called computer-supervised instruction, computer-managed media, or computer-administered instruction, and involves using the computer in a directive and multisensory fashion. The student is guided through an array of computer-controlled media, such as slide projectors, video or audio tape, or directed to use noncomputer-controlled media, such as programmed-text materials, books, projectors, or video or audio devices operating separately from the computer. Visual and audio materials dominate this strategy. The computer manages the student through the process and accumulates data on his progress.

3. *CAI—Includes CAL, CMI, and nonadministrative, instructionally related activities which facilitate learning:* Computer-assisted instruction is the generic term and includes any use of the computer to facilitate learning. Faculty test scoring, computer-assisted counseling, and generation of test questions from data banks are examples of other uses. CAI is an all inclusive term which has now passed into the language.

Obviously, in designing effective learning segments, combinations of the three areas discussed may be used. There is clearly a distinction in design and preparation for using each approach alone or in combination. Accommodating communication between professionals in computer-assisted instruction, faculty, and administration in planning and preparation of materials dictates the necessity for understanding the discrete differences between these approach strategies.

INSTRUCTIONAL STRATEGIES

Different types of possible course segments and theoretical combinations of CAI instructional strategies can also be clarified. One possible obstacle to the development of CAI is that no agreed-upon theory exists to guide educators in choosing between alternate instructional strategies which specify the sequencing and form of materials for computer assisted instruction. Below are several alternative instructional strategies which might be considered when developing materials.

1. Drill and Practice

Drill and practice is best applicable in the area of low-order skills and generally has a stylized format in terms of both items and responses. The student need not understand how the computer works when using this strategy. He simply responds according to directions.

1.1 Linear Drills

This form of drill and practice involves all students going through the same items in the same order, at an individualized pace, but with a low level of individualization. The student simply responds according to instructions.

1:2 Answer Processing

This is a more sophisticated branching activity in which the computer may evaluate responses in terms of alternatives and may skip the student backward or forward on the basis of his response. The student responds according to prescribed directions.

1.3 Computer-Generated Responses

This is the highest level of drill and practice. In this form of CAI, the student may have a dialogue with the computer terminal. An example would be a language translator program in which the student might enter a sentence in one language and the interpretation might be returned by the computer. The student need not be familiar with how the computer works, since he interacts by using a natural language.

2. Tutorial

Constructed responses are used. Responses may be linked with algebraic or other languages. In this form of CAI, the computer may respond to the student with answers it has stored in its memory to the extent that algorithms provide access to the information.

3. Problem Solving

This aspect of CAI involves straightforward use of the computer to compute. Using this strategy, the student, familiar with a language which permits him to interact with the system, can enter data and the steps necessary to achieve the solution to the problem.

4. Simulation

Problem solving, discovery, application of concepts and rules may be part of this area. Generally, models based on inquiry, logic, or on mathematical algorithms are used. Models of real or idealized situations can be prepared. The student can interpret variables and their relationship to situations presented in the model. Students may interact with the computer by using natural language in this mode of use and may use some programming language to solve problems.

The in-basket technique or management games are examples of this approach. Both discovery and an interactive tutorial approach can be embodied here.

A CAI INSTRUCTIONAL SYSTEM

Figure I depicts a simple CAI instructional model through which any of the strategies we have discussed can be visualized. If we look at the components

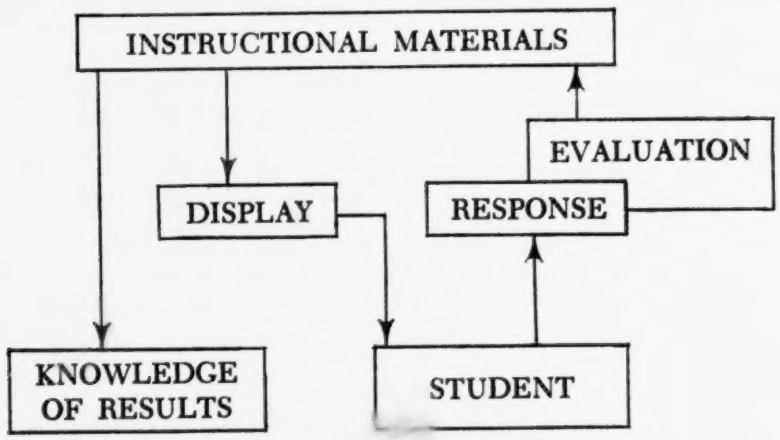

FIGURE I. CAI INSTRUCTIONAL MODEL.

of this model and visualize how it works, we see that it is no more complicated than normal teaching. The dream is that of individualized instruction, with, ideally, control of learning in the hands of the learner.

The dream of computer-assisted instruction will involve use of various media. Fulfillment of the dream, however, finds several obstacles which must be treated to fulfill the reality.

I am conducting a study designed to identify critical obstacles to the development of computer-assisted instruction and to draw implications for the junior college. Assisting with the study are the RAND Corporation (now conducting a study of CAI for the Carnegie Commission) and Dr. B. Lamar Johnson, professor of higher education at the University of California, Los Angeles. After reviewing the literature and meeting a number of times with the RAND CAI group and conducting numerous interviews, the following list of obstacles has been developed. The degree of cruciality of each is now being determined in the study.

OBSTACLES TO COMPUTER-ASSISTED INSTRUCTION DEVELOPMENT

I. Learning Theory

1. No agreed-upon theory exists to guide educators in choosing between alternative instructional strategies which specify sequencing and form of materials for CAI (tutorial, drill and practice, problem solving, etc.).
2. Means of measuring educational effectiveness of CAI has not been perfected.

II. Software

3. Developed software cannot be easily shared (restricted by language and machines).
4. Instructional programming languages are not sufficiently powerful.

III. Technology

5. Computer equipment (main hardware) has not been developed on which CAI materials can be used effectively.
6. Satisfactory terminal devices do not exist for general use.
7. Computer-controlled audiovisual devices do not exist for general use.

IV. Personnel Considerations

8. There is a shortage of individuals with appropriate component skills.
9. Skills necessary for adequate instructional software preparation have not been established.

V. Organizational Structure

10. Personnel combinations necessary to develop effective materials have not been clearly identified.
11. The traditional nature of education does not lend itself to CAI.

VI. Communication and Distribution

12. A communication gap between practitioners in education and hardware/software designers exists.
13. Existing materials are not documented properly for sharing with others.
14. Proper mechanisms to distribute materials do not exist.

15. Copyright laws regarding the use of materials produced have not been perfected to protect the interests of both the public and private enterprise.

VII. Economic

16. CAI is too expensive for the results obtained.
17. Funds to support advancements in the state of the art are not adequate.
18. Funds to support implementation by individual colleges are not sufficient.
19. Incentives (financial and other) are not sufficient to stimulate preparation of materials.

VIII. Attitudes

20. Attitudes of faculty, administrators, students, and the public toward CAI are not yet positive.

If the obstacles noted are satisfactorily resolved, we can perceive benefits for education, some of which will make it possible to: (1) control the sequence and pace of materials—either individually or on a class basis; (2) minimize redundant activity and dull drill based on mastery of materials; (3) provide flexibility opportunity for tutorial instruction; (4) free teachers for more individual work with students and to develop better materials; (5) provide opportunity for remediation and practice; (6) make learning more systematic and planned; (7) monitor and feed back information on student progress; (8) reinforce positive behavior; and (9) simulate real-life or complex situations.

All of the arguments for and against computer-assisted instruction cannot be treated in this short paper. Several, on which there has been much discussion, however, can be examined.

Some argue that programmed workbooks will do what the computer can do and at less cost.

Limitations of Programmed Instruction

1. In programmed instruction, feedback is immediate, but highly restricted in format.
2. In programmed instruction, it is difficult to employ audia-visual devices under program control.
3. Only limited branching is available, due to the multiple-choice responses intrinsic in programming.

Advantages of Computer-Assisted Instruction over Programmed Instruction

1. Interprets constructed responses.
2. Provides immediate feedback to the teacher.
3. Includes rapid retrieval of information from large data files.
4. High computational ability at the disposal of the student, which can be integrated into a design prepared to help the student learn in an optimum way.

Cost is the other aspect of the arguments under discussion. Consider what has happened to the cost of the complicated color television set since 1948. Research and development have brought costs to the point where these sets are now in wide use. Certainly, the analogy clearly demonstrates that the cost

of the devices of the future will reduce significantly. When developed materials can be easily shared and the cost of the hardware is reduced, how can one logically say that the dream will not be realized? Especially, since the only cost of eduaction which is reducing is the cost of devices.

REALITY IN THE ORANGE COAST JUNIOR COLLEGE DISTRICT

Earlier, I mentioned some of the developments taking place within the Orange Coast Junior College District. The description that follows is of the organizational plan now in existence to assist in realizing the dream.

The district has established the Office of Educational Development to assist in many areas, including the development of CAI. Much external support is necessary from research institutions, such as the university, and from industry.

The Office of Educational Development will work with faculty in developing appropriate strategies using the computer and other media. Faculty fellowships and grants have been established and paid for from district funds as well as through outside sources. Student assistants will be employed to help optimize faculty abilities. The Office of Educational Development has been organized to help foster innovation and to help facilitate and maintain a continuous-progress environment composed of internal thrust and external involvement.

The strategy of the district includes organized and documented development on projects in which faculty are working formally with the Office of Educational Development. Such projects have powerful potential in establishing successful models which can be copied. These projects will be documented for sharing and maintenance. Preparation will involve screening of intent and justification, techniques of instructional design, and feedback based on execution and evaluation, forming a loop leading to improved materials.

Other activity is taking place in the district. In some cases, this activity is well documented and will be evaluated, in others it may be classed as "computer-generated activity" on the part of either staff or students. The computer is available for all to use. Materials may be prepared by a faculty member, free from interference. Should the faculty member simply want to use or to be exposed to the hardware, he may do so. Should he desire support—it will be available to him through the many district resources.

It is through this dual approach that we are proceeding toward the dream.

THE DREAM

Through the reality of portable terminals, ancillary media developed to fit the computer, rising skills of teachers and technicians in using the computer, and increasing research on CAI, we will find that the computer has an important role to play in helping individuals learn.

In talking with those who look to the future, such as Dr. Roger Levien, head, systems science division at RAND, or Dr. George Comstock, working at RAND on a study of CAI in the future for the Carnegie Commission, several directions become apparent.

Networks into which schools may connect and subscribe to prepared materials will soon become a reality. Materials through these communication net-

works can be coupled with materials that faculty members at the school have developed.

Problem-solving uses in all fields will dominate the strategies. The other strategies, however, will also permeate instruction.

Our concept of the classroom of tomorrow will change. Learning will become more flexible, more individually paced, and students will be provided the capability of managing information. Communication networks will make carefully designed materials available, and this will both stimulate and assist subject specialists.

The role of the teacher will change. The teacher of tomorrow will be an instructional designer, manager of individualized, learner-controlled instruction, and master of his discipline. As instructional designer, the teacher will work with media specialists and learning-system programmers (such as the one now employed in the Orange Coast Junior College District); as a manager of individualized instruction, the teacher will supervise proctors and technicians in the execution of teacher-controlled presentations. He will spend time with students—inspiring, counseling, motivating, diagnosing, and prescribing for them as they move through the learning process.

Rising school enrollments, underemployment, increase in youth unemployment, shortages of personnel in many fields, necessity for continuous retraining, continuing self-renewal in work, need for more continuing education, rapid growth of knowledge, demands of students, financial strife in education, and changing folkways and mores—all call for educational experiences relevant to contemporary times and reflect an accelerating demand for added opportunities at all levels of education. Coupled with rapidly changing educational technology and increased understanding of the learning process, these developments create the necessity for educators to reexamine the teaching/learning process.

CAI, as a medium in the process, is both a reality and an achievable dream. Computer-assisted students are here now. At the present pace of change, we must recognize that "today is already tomorrow." Educators must accept the challenge issued by the Orange Coast Junior College District in the concluding statement of its film *1 to 1:*

> If we can relate a seed to life,
> An atom to energy,
> Man to space,
> A light beam to surgery . . .
> Why not: A computer to learning?

B. LAMAR JOHNSON

TOWARD CHANGE AND IMPROVEMENT IN JUNIOR COLLEGE INSTRUCTION

Assisted by a grant from the ESSO Education Foundation, I recently completed an eighteen-month survey of innovations in junior college instruction. My survey took me to junior colleges in twenty-two states. By means of personal visits, conferences, or by written reports, more than four of every ten of U. S. public junior colleges were covered.

Perhaps the major findings of my survey are suggested by two titles: one a monograph, and the other of a book. In 1963, I made an exploratory national survey of innovations in junior college teaching—the results which I reported in a monograph under the title *Islands of Innovation*.[1] I wrote, "The general picture revealed in the survey is one of significantly less experimentation than would be expected, or certainly hoped for, in an institution which is often referred to as 'the most dynamic unit of American education.' "[2]

Findings of my more recent survey are reported in *Islands of Innovation Expanding: Changes in the Community College*.[3] This title suggests more encouraging findings. Innovation and experimentation are clearly increasing in the junior colleges of our nation.

Something of the spirit of the survey is suggested by a conversation with a Georgia dean. After describing a plan of developmental instruction used at his college, the dean apologetically explained, "None of these ideas is original with us. We have stolen all of them." To which I replied, "Fine, the purpose of the survey which I am making is to encourage such thievery."

It is my hope that the report of this survey will encourage innovation and experimentation in junior college instruction by stimulating idea stealing. This perhaps will serve a similar purpose.

In this presentation I propose to make two points: (1) There are procedures and conditions which encourage change and innovation in instruction; and (2) Change and innovation are not enough. Improvement must be our watchword.

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[1] B. Lamar Johnson, *Islands of Innovation* (Los Angeles: Junior College Leadership Program, Graduate School of Education, University of California, Occasional Report No. 6, 1964).
[2] *Ibid.*, p .12.
[3] B. Lamar Johnson, *Islands of Innovation Expanding: Changes in the Community College* (Beverly Hills, Calif.: Glencoe Press, 1969).

PLANS WHICH ENCOURAGE CHANGE AND INNOVATION IN JUNIOR COLLEGE INSTRUCTION

In my recent survey I sought to identify plans, procedures, and conditions aimed at encouraging innovation in junior college instruction. Here are some of them.

1. *The Right to Fail.* The administration at Roger Williams College, Rhode Island, points out that, if a college is to encourage innovation and experimentation, its faculty must have a sense of security which will permit them to be venturesome. They must be interested and willing to try out new ideas without fear that failure will threaten their status as innovators. When new ideas are tried, some of them inevitably will be unsuccessful. If faculty members are blamed for the failure of apparently well-conceived new plans, they are unlikely to try other innovations. The right to fail, then, is one which must be guaranteed in the innovating college as completely as academic freedom is guaranteed in all of higher education.

2. *Visits to Centers of Innovation.* Few changes which occur in education are completely original. Most of them, in large part or small, are borrowed. Faculty members should have awareness of promising innovations so that they may recognize both the need and the possibility of change.

It is this viewpoint that has led a number of colleges to develop programs in which faculty members visit centers of innovation. Through the Innovations Project at Delta College, in Michigan, for example, fourteen faculty members were employed to devote full time to seeking out innovative practices which, during the fifteen-week summer session in 1966, might be adopted for use at Delta. Representatives of the team visited sixty-four innovative centers—most of them in junior colleges, but some in senior institutions and in research agencies—in nine states. As a result, a variety of new plans and procedures has been adopted for teaching, counseling, and community service at Delta. The most important outcome of the project, in the words of one member, was the emergence "of an atmosphere for change."

3. *Reading.* Through reading one can become better informed about new developments. The printed word, as it is, is a less spectacular source of information than on-the-scene observation. Yet it may provide the spark needed to kindle imaginative new approaches to innovation. The Delta College Innovation Project was not, for example, entirely devoted to travel and to visits to centers of innovation. Members of the project team developed reading lists and assembled a library on innovation and experimentation. They read widely and engaged in extensive study and discussion of their reading before, during, and after their travels.

4. *Saturation of Campuses with Multimedia Aids to Learning.* Some junior colleges "saturate" their campuses with multimedia instructional facilities as an aid to stimulating faculty members to creativity in teaching. At such colleges, many varieties of technological aids, including the local production of teaching materials, are made generously and conveniently available to faculty members. On the campuses of the Junior College District of St. Louis, for example, the convenient and generous provision of aids to teaching (including electronic facilities as well as printed matter) is notably important in encourag-

ing and aiding instructional innovation and experimentation. The provison of these facilities is coordinated by the districtwide "director of instructional services"—with personalized service provided on the respective campuses.

Miami-Dade Junior College, in its learning resource center, provides a library with an "assistant in learning" available to the faculty. The latest electronic and technological aids to learning, are available for demonstration.

5. *Evening Programs and Student-Operated Experimental Colleges.* Evening programs often offer a degree of freedom and flexibility which may not be present in day college. New courses and teaching plans are frequently "tried out" in evening colleges. If successful, they then may be added to the regular curriculums. Similarly, courses launched in student-operated experimental colleges are at times added to the college curriculum.

6. *Manageably Small Experimental Units.* A number of colleges with large enrollments encourage innovation and experimentation by establishing—within their larger entities—manageably small experimental units. Among senior colleges and universities, for example, Wayne State University has established and operates Monteith College as an experimental college; Hofstra University has its New College; Michigan State University has its residence-hall plan; and Stephens College, its house plan. The University of the Pacific and the University of California, Santa Cruz, have adopted a cluster-college plan.

Several junior colleges are planning relatively small experimental units. Laney College has received a grant from the California State Department of Education to develop an experimental vocational college. These experiments would involve student participation in program planning and operation, and would feature individualized and individualization of instruction.

In the spring semester of 1968, El Centro College in Dallas established Mini-College, a unit in which five instructors teach five different courses (English, History, Art, Psychology, and Mathematics) to the same 180 students. Also available are the services of a counselor, a reading specialist, a media specialist, a data-processing director, and a curriculum coordinator. Mini-College aims to add new dimensions to team teaching as relationships among various fields are identified and explored, and as the five instructors, aided by associated staff members, work together in teaching a single group of students. Mini-College also aims to help students achieve a sense of personal identity by becoming members of a small group within a large institution.

7. *Agents of Change.* Innovations are often stimulated by developments outside a college. Visits to centers of innovation and participation in conferences can—as already pointed out—help faculties become better acquainted with new developments in education. In addition to "outside stimulators," however, there must be within a college an agent or agents of change.

An agent of change may be a dean of instruction or a president, an instructor or a department head, or even a committee of faculty members and/or administrators charged with responsibility to stimulate change. But whether it is an individual or a group, the change agent must have certain characteristics. For ease of grammatical construction, let us assume the change agent is an individual. He must have the capacity to stimulate creative thinking and planning, and the ability operationally to support experiments. An important re-

sponsibility is to establish "the right to fail" (to which reference has been made earlier), for inevitably some new ideas will not succeed.

I have suggested that junior colleges appoint, as agents of change, vice presidents in charge of heresy.[4] An agent of change need not be an individual, but may be a committee. Monroe Community College, Rochester, New York, for example, has an Educational Systems Committee which consists of twelve faculty members, representing various departments, who are interested in experimental and innovative developments. It is the purpose of the committee both to initiate and to screen proposals for innovation. Individual staff members are encouraged to plan innovations and present them to the committee, which, in turn, makes its recommendations to the president.

8. *Sensitivity-Training and Encounter Groups.* Under the title, "A Practical Plan for Educational Revolution," Carl R. Rogers, in a recently published paper, asserts:

> . . . change must be self-directed, self-chosen . . . whether for the individual, the group, the organization or the body politic; change must not be imposed on schools or their members. An effective instrument of this self-directed change in persons, in groups, and in organizations does exist. This instrument is the intensive group experience, often called the basic-encounter, the *T*-group, or the sensitivity-training group. This basic-encounter group is a significant means of freeing an educational system so that it can become involved in self-directed changingness—a continuing process of alteration and revitalization of the organization and the persons who make up that organization.[5]

Without claiming to plan for "educational revolution," staff members at Dallas County Junior College District are using the "Rogers-advocated" plan of sensitivity training. In May 1968, forty staff members (including all administrators except five who had conflicting commitments, plus several instructors and counselors) of the District and of El Centro College participated in sensitivity-training groups. The immediate purpose was to develop greater interpersonal and communication skills in the administrative staff. The implicatons of *T*-group experience for classroom instruction was, however, soon noted, particularly by the instructors and counselors who participated in the groups. Accordingly, on the recommendation of the Faculty Association, sensitivity training was made available to some one hundred staff members during the spring of 1969.

In a sense, the El Centro College plan proposes to make it possible for sizable numbers of faculty members to become agents of change—and concurrently achieve the type of faculty involvement that is essential to sound innovation.

9. *Budgeting for Innovation.* "Change Agents" in colleges must clearly have the support of their college administration. Whether an agent of change is a dean, a vice president in charge of heresy, or an "educational systems committee," funds—of course, within the financial limitations of the college—must be made available to support the costs of planning innovations and putting them into operation.

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[4] B. Lamar Johnson, "Needed: Experimental Junior Colleges," *Junior College Journal,* XXXVI (Oct. 1965), 17–20.

[5] Carl R. Rogers, "A Practical Plan for Educational Revolution," in Richard R. Goulet, ed., *Educational Change: The Reality and the Promise,* A Report on the National Seminars on Innovation, Honolulu, July 2–23, 1967 (New York: Citation Press, 1968), p. 120.

But more than dollars must be budgeted if colleges are progressively to encourage innovation. One of the major problems in innovating relates to the provision of faculty time for such efforts. The interests and enthusiasms of staff members are often reflected in their "extra-time work" on new ideas and plans for teaching. At times, the introduction of innovations does not actually require additional staff time; some new plans may, in reality, be time-saving for staff members.

On the other hand, many new ideas do require time for their development beyond that available to faculty members. It is with this in mind that some junior colleges provide released time during the college year or employ faculty members during summers to work on new plans and programs. Among those which follow this plan are Chicago City College, the Junior College District of St. Louis, and the Orange Coast Junior College District.

10. *Motivation by Budget Restriction.* The availability of funds for innovation, whether from the operational budget of a college or from government or foundation grants, is clearly an important factor in encouraging new developments in instruction and the curriculum. But there is always the imminent possibility that colleges may increasingly be compelled to operate under reduced budgets. As college enrollments increase sharply and as the costs of education rise, taxpayers are raising questions about rising expenditures for higher education—and, indeed, are at times demanding a halt to them.

Visiting with a president of a college that has a national reputation for innovation, I learned that the college had one of the lowest cost-per-student records of any junior college in its section of the country. "Tell me," I asked, "how can you afford to innovate with such a low per student cost?"

"The real question is, how can we afford not to innovate? We have," he continued, "studied this question and have come to the conclusion that we cannot—philosophically, educationally, or financially—afford not to innovate."

Abraham Baldwin Agricultural College was in 1965–66 confronted with a financial crisis that demanded action. For in that year the college had a 30 percent increase in enrollment and a near stationary budget. A faculty-wide study was made to answer the question: "What must we do?" As a result of this investigation, several innovative practices were introduced. For one, team teaching was established for large sections of college algebra and American government. For another, audio-tutorial teaching was used in biology.

I am not, of course, urging that colleges should become innovative institutions solely for the purpose of saving money. I am, however, pointing out that innovation need not be limited to wealthy institutions. As a matter of fact, financial restrictions may, upon occasion, serve as an impetus to change and improvement.

IMPROVEMENT MUST BE OUR WATCHWORD

I have described a variety of plans and conditions which encourage innovation. There is, however, a warning which we must proclaim. There is a danger of confusing educational novelty with soundly conceived innovation directed toward specific goals. "With so many active partners in educational innovation," Chauncey points out, "the result may be chaos unless careful

coordinated planning and evaluation accompany the current enthusiasm for change and experimentation."[6]

Innovation is not a goal in and of itself. Change simply for the sake of change cannot be condoned. New plans can be justified only if they result in improvement.

Improvement must be our watchword!

I have two suggestions which can, through innovation, lead to improvement:

Identify the specific instructional objectives of any innovation which is used.

Evaluate the outcome of each new development in instruction on the basis of its achievement of objectives.

1. Defining Specific Instructional Objectives

Skinner points out, "The first step in designing instruction is to define terminal behavior."[7] Decisions regarding what students are expected to learn are important in any type of teaching and are basically essential to effective curriculum development. Defining specific instructional objectives and making them known to students is perhaps the single most important contribution which a college and an instructor can make to the learning of many students.

In an increasing number of junior colleges, faculty members are defining specific instructional objectives as a basis for both curriculum development and the improvement of instruction. The educational program of Santa Fe Junior College, Florida, for example, is being projected on a rationale which stresses the definition of college purposes in terms of student behavior. This has required definitions of desired behavior and an examination of the characteristics of Santa Fe students.

The definition of specific instructional objectives as a basis for developing the curriculum and improving instruction emerged as a thematic emphasis in the survey of innovations in junior college instruction. In using technological aids to learning, for example, desired outcomes must be defined. If this is not done, such aids become merely the costly trappings of gadgetry.

Up to the present, the definition of instructional objectives as a basis for improving instruction can by no means be identified as a trend in the junior colleges of our nation. Such definition is, however, emerging as an important emphasis at some junior colleges. This emergence may well point to a dynamic focus for the future.

Such a focus is projected by Cohen in his recently published *Dateline '79: Heretical Concepts for the Community College.*[8] In this volume, Cohen "presents a paradigmatic picture of a community college as it might look in 1979."[9] In such a college as he projects, "student achievement of specific learning objectives is the focus—the acknowledged, sanctioned, overriding purpose of the institution."[10]

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[6] Educational Testing Service, *Annual Report 1965–1966* (Princeton, N.J.: Educational Testing Service, 1967), p. 12.
[7] B. F. Skinner, *The Technology of Teaching* (New York: Appleton-Century-Crofts, 1968), p. 199.
[8] Arthur M. Cohen, *Dateline '79: Heretical Concepts for the Community College* (Beverly Hills, Calif.: Glencoe Press, 1969).
[9] *Ibid.*, p. xx.
[10] *Ibid.*, pp. 5–6.

2. Evaluation of the Basis of Objectives

In my survey of innovations in junior college instruction, I sought evidence regarding the effects of new plans of teaching. I asked for evaluative reports—both in correspondence with and in visits to junior colleges.

A few examples of evaluation were reported. Representative of these are the evaluations of teaching by television at Chicago City College and of audio-tutorial teaching at Golden West College. And the Innovations Center at Miami-Dade Junior College features evaluation as an essential part of its organization and operation. These are isolated examples only.

There is a paucity of evidence regarding the success of new developments in junior college teaching. Evaluation of instruction is largely a missing entity in the junior colleges of our nation, as it is indeed in most of American education. Rigorous and vigorous evaluation is greatly needed. And it must be based on specific learning objectives.

CONCLUSION

To meet the critical challenges which confront the junior college in these days of change, education relevant to our time must be sought and the highest quality of learning achieved. Innovation and improvement are essential. Changes in instruction are taking place in the junior colleges of our nation. More are in the offing, and more are needed.

But change is not an end in itself. We dare not be merely hucksters of educational novelties and hawkers of educational gadgets. Increased and improved student learning must be the goals to be sought. To this end, as we innovate, we must identify the specific instructional objectives of any new plan which we introduce, and we must evaluate its outcomes on the basis of its objectives. Specific objectives and evaluation must be our slogan, as improvement is our watchword.

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Occasional Reports from UCLA Junior College Leadership Program:

1. Frederick C. Kintzer. *Faculty Handbooks in California Public Junior Colleges* (Junior College Leadership Program, Occasional Report No. 1). Los Angeles: University of California, Los Angeles, 1961. Price, $1.00.

2. Frederick C. Kintzer. *Board Policy Manuals in California Public Junior Colleges* (Junior College Leadership Program, Occasional Report No. 2). Los Angeles: University of California, Los Angeles, 1962. Price, $1.00.

3. *Institutional Research in the Junior College—A Report of a Conference* (Junior College Leadership Program, Occasional Report No. 3). Los Angeles: University of California, Los Angeles, 1962. Price, $1.50.

4. Frederick C. Kintzer, *President's Report in American Junior Colleges* (Junior College Leadership Program, Occasional Report No. 4). Los Angeles: University of California, Los Angeles, 1963. Price, $1.50.

5. *Establishing Junior Colleges* (Junior College Leadership Program, Occasional Report No. 5). Los Angeles: University of California, Los Angeles, 1964. Price, $1.50.

6. B. Lamar Johnson, *Islands of Innovation* (Junior College Leadership Program, Occasional Report No. 6). Los Angeles: University of California, Los Angeles, 1964. Price, $1.00.

7. B. Lamar Johnson, ed. *New Directions for Instruction in the Junior College* (Junior College Leadership Program, Occasional Report No. 7). Los Angeles: University of California, Los Angeles, 1965. Price, $2.00.

8. B. Lamar Johnson, ed. *The Junior College Library* (Junior College Leadership Program, Occasional Report No. 8). Los Angeles: University of California, Los Angeles, 1966. Price, $2.00.

9. B. Lamar Johnson, ed. *Systems Approaches to Curriculum and Instruction in the Open-Door College* (Junior College Leadership Program, Occasional Report No. 9). Los Angeles: University of California, Los Angeles, 1967. Price, $2.00.

10. Ervin L. Harlacher. *Effective Junior College Programs of Community Services: Rationale, Guidelines, Practices* (Junior College Leadership Program, Occasional Report No. 10). Los Angeles: University of California, Los Angeles, 1967. Price, $2.00.

11. Arthur M. Cohen, in collaboration with Florence B. Brawer. *Focus on Learning: Preparing Teachers for the Two-Year College* (Junior College Leadership Program, Occasional Report No. 11). Los Angeles: University of California, Los Angeles, 1968. Price, $2.00.

12. B. Lamar Johnson, ed. *The Experimental Junior College* (Junior College Leadership Program, Occasional Report No. 12). Los Angeles: University of California, Los Angeles, 1968. Price, $2.00.

13. B. Lamar Johnson, ed. *The Junior College President* (Junior College Leadership Program, Occasional Report No. 13). Los Angeles: University of California, Los Angeles, 1969. Price, $2.00.

14. Don A. Morgan. *Perspectives of the Community College Presidency* (Junior College Leadership Program, Occasional Report No. 14). Los Angeles: University of California, Los Angeles, 1969. Price, $2.00.

15. B. Lamar Johnson, ed. *The Improvement of Junior College Instruction* (Junior College Leadership Program, Occasional Report No. 15). Los Angeles: University of California, Los Angeles, 1970. Price, $2.00.

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